

COMPUTER WORLD

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NBS Seeks Comments on Proposed Cobol Standard

By Don Leavitt
CW Staff writer
WASHINGTON, D.C. - Users and vendors have been urged to comment, within the next month, on a proposed Cobol standard developed for federal agencies by the National Bureau of Standards.

If the proposal becomes a Federal Information Processing Standard, it would apparently provide much of the centralized guidance the General Accounting Office recently found missing in the government's efforts to develop or acquire software (CW, July 21).

In addition, software standards applied government-wide are very likely to affect outside users as well, according to one industry source, just because of the size of the government's EDP operation.

Under the NBS plan, all business-oriented applications developed or acquired for use by federal agencies would have to be written in the Federal Standard Cobol. The only exceptions would be jobs to be run on CPUs that have no Cobol capability, or jobs in which other languages or programming systems are clearly more

economical to use.

Other languages, appropriate to other application areas, are being considered for future adoption as Federal Standards, NBS said.

The NBS Cobol proposal does not conflict with the American National Standard Institute (ANSI) standard established in 1968. Instead, it appears to carry standardization further than ANSI did.

In the ANSI standard, a nucleus and a series of Functional Processing Modules (FPM) were defined. The nucleus

has to be present but can be implemented on a high or low level. Each FPM may be implemented on two or more levels. Some may be left out completely.

Computers can theoretically be built in any of the more than 2,000 combinations and still be called ANSI-standard Cobol. Computers using more than a dozen of the combinations are currently available. Transferability between CPUs that support Cobol is often frustrated by these differences in the "ANSI-standard Cobol" compilers.

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Dialog Continued

ACM '71 Next Week

By Edward J. Bride
CW Staff writer
CHICAGO - Computer development in two wide-ranging professions - health and education - will be in the exhibit spotlight at the national convention of the Association for Computing Machinery, slated for the Conrad Hilton Hotel here Aug. 3-5.

There are only 10 exhibits, all of a public service nature. The exclusion of commercial exhibits was an innovation at last year's convention, and its continuance reflects ACM's current slogan, "decade of dialog" with the public.

There will be no ecological or electoral systems on display, according to Fred Harris, chairman of special activities for ACM '71. The exhibits will be open to the public at no charge.

ACM members who are currently unemployed will be admitted to the entire conference

free of charge, although they will be required to pay for copies of the *Proceedings*.

Admission charge for the three-day event is \$35 for ACM members and \$40 for nonmembers, but the difference can be applied toward membership, if desired.

Reduced registration rates for students and military personnel in uniform will be restricted to ACM members, and are \$5 members and \$10 for all three days; they do not include copies of the *Proceedings*. An ACM official said a firm price had not been placed on the *Proceedings*.

In the exhibit area, several systems will be demonstrated to show how the computer can be used to benefit the health and educational status of the general public.

● A multi-state psychiatric patient record-keeping procedure, designed to follow patients throughout all phases of service, and

to record experiences at key points.

Newest honor for Cmdr. Grace Hopper is an annual award to be given in her name by Univac at ACM's annual conferences.

● A physics project to develop extensive teaching materials, especially for effective computer use in beginning physics courses.

● A facility for postoperative intensive care monitoring.

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Users Asked to Ease Power Supply Drain

By Edward J. Bride
CW Staff writer
WASHINGTON, D.C. - If you are running your DP center on one or two shifts, consider rescheduling your operation so 9-4-5 is your scheduled downtime, if you want to help lessen the nation's power crisis.

Start your air conditioning equipment early and make the DP center extra cool, before the normal power surge occurs.

If your DP center is extra cool and comfortable, consider raising the temperature five degrees, if your equipment certification will permit.

These are a few of 15 recommendations of the President's joint board on energy matters, which has advised consumers and industrial power users that an extensive energy conservation program is the best way to avoid emergency power situations this summer.

Commerce Secretary Maurice H. Stans officially released the board's Industrial Energy Conservation Program and cautioned that the generating capacity in several parts of the country depends on the prevalence of the normal temperatures and the reliability of generating equipment.

Different Threats

The Joint Board on Fuel Supply and Fuel Transport, official name of Stans' group, said the fuel situation is much improved over last year, but generating capabilities present different threats to power users.

The board has therefore established three separate plans to conserve electric power: a public program administered by the President's special assistant for

consumer affairs, a government program coordinated by federal, state, and local authorities, and the industry conservation program. The industry program was developed for the board by the Bureau of Domestic Commerce, in cooperation with the Office of Emergency Preparedness, other government officials, industry and trade associations, and private individuals.

While the industry plan is not specifically aimed at computer users, the measure allows

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New! 1130-4
30% Slower,
30-50% Less

WHITE PLAINS, N.Y. - IBM has reduced the power of the integral disk 1130 small processor and created an 1130 Model 4 that offers users savings of 30% to 50%. Cycle time on the Model 4 is 5.85 μ sec, compared with 3.6 μ sec or 2.2 μ sec on other 1130 models.

IBM also introduced a new printer, the 1132 Model 2, for \$180/mo, that prints alphanumeric at 40 line/min, and numerics at 55 line/min.

The price of the Model 4 is \$25,985 for an 8K byte version or \$628/mo - and \$15,680 or \$450/mo for the 4K version. These are the only memory sizes available.

The Model 2 - 3.5 μ sec with integral disk storage - is the previous model most similar to the 1132. The 8K Model 2 sells for \$41,475 and rents for \$980, while the 4K unit sells for \$33,570 and rents for \$740.

IBM said that on job stream benchmarks the new system offered 70% of the performance of a Model 2 system.

Funds for Data Bank Challenged

CW Washington Bureau
WASHINGTON, D.C. - An amendment to a Justice Department appropriations bill aimed at delaying the establishment of new computerized data banks

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and of a substantial expansion of existing systems was defeated in the Senate last week, 58-29. Sen. Charles Mathias (R-Md.) had attempted to halt funding for the first six months of this fiscal year to give Justice's Law Enforcement Assistance Administration (LEAA) time to submit a report, as directed earlier by Congress.

Mathias said that Congress has an obligation to establish clear guidelines and controls for criminal justice data banks operated by federal agencies, and that LEAA was six weeks late in presenting its recommendations to promote integrity and accuracy of data banks (CW, July 21).

"The last word to me from the Justice Department," he said, "was that the LEAA recommendations are still undergoing review and revision somewhere in

the executive branch."

Appropriations for fiscal 1972 for Justice include \$4.3 million - \$1.3 million for the FBI and \$3 million for LEAA - to enhance the computerized National Crime Information Center (NCIC) and to expand Project Search from 15 to 25 states.

"More millions in LEAA funds," according to Mathias, "are intended to support a wide variety of state and local criminal information and intelligence projects." He added that as many as 46 states "are expected to have some type of computerized data system" by June 30.

Mathias said that his amendment was aimed at underscoring to justice "the importance Congress attaches to the issue of data banks and what they are going to mean to America in the future."

★ 1971 ★
Communications Supplement
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Health, Education Applications Highlight ACM '71 Show

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• A program to "teach teachers how to teach data processing," as one ACM official described the Secondary School Computer Science Education program being used by the Illinois Institute of Technology. The program includes a master of science degree for teachers in information and computer science.

Other displays will include an on-line demonstration of the trauma registry in operation at Cook County Hospital and the University of Illinois Medical Center [CW, June 14], and the display of some prototype equipment involved in a system called Plato IV. Goal of that project is a low-cost student terminal and communication network, i.e., less than \$1 per hour of hookup time.

The city of Chicago will describe its centralized "Mayor's Datacenter," which serves more than 25 city departments. Applications highlighted in a slide presentation will include on-line systems for the

police, purchasing, comptroller's, building, and water departments. The display will also describe some micromation uses.

Program Preprints

There are few innovations this year, the major one being the availability of "preprints" of any two of eight selected Technical Program Sessions, if attendees pre-registered.

All eight sessions will be included in the Proceedings, but the preprints are intended to provide registrants with advance information on two particular topics; e.g., personnel testing and the impact of professionalization efforts on the DP manager.

There were no early figures available for attendance estimates, and ACM officials only offered "guesstimates" that about 900 might attend. Some other conferences offer substantially reduced rates for advance registration, and an association

spokesman predicted "considerable" door crowds because of this "unfortunate" void.

Last year's conference, held in New York, drew 2,000 people to the exhibit area (at \$2 per person), and about 2,000 more to the full technical conference.

One of the special attractions at this year's meeting will be an extensive "quarter century view" of the development and prospects of computer technology. Some of the industry's most prominent consultants will spend Tuesday afternoon discussing people resources, business applications, management lessons and trends, while a Wednesday session will emphasize trends and developments envisioned for the next 25 years.

The 25th anniversary of Eniac also will be commemorated. Univac, which employs many of the computer pioneers, has initiated an award in honor of one, Navy Cmdr. Grace M. Hopper.

The Hopper award will be presented to Dr. Donald E. Knuth of Stanford University who, at the age of 30, authored *The Art of Computer Programming*.

The maximum age of 30 was imposed because, according to ACM, Cmdr. Hopper has given "continuous support of young computer careerists." The award carries a \$1,000 honorarium, as does the presentation of the A.M. Turing lecture by Dr. John McCarthy, also of Stanford. He will discuss the state of artificial intelligence.

Technical Topics

Information retrieval, computer chess, real time applications, communications, and a reexamination of the centralization/decentralization issue are some of the topics for technical sessions [CW, June 23].

Besides being prominent on the exhibit floor, the topic of medicine and biology will be discussed in nine separate papers at a Thursday afternoon session. A panel discussion that same day will probe computer science contributions to learning and teaching.

The second annual computer chess tournament will be conducted during ACM '71, with six participants expected to compete, including last year's champion, Northwestern University.

A "special events" innovation will be the presentation of a play called "Origin 0400," a "message play" intended to show the "dilemma of machine age society and associated problems."

A group known as the First National Theatre and Trust Co. of Chicago will present the play Tuesday and Wednesday at 8:30 p.m. Conference publicity says the play "points out the need for clarity and meaningful expression in our everyday language. It deals with the problems of communication, manipulation and dehumanization of individuals."

Other special events will include computer music and art, a ladies program, and some tours of Chicago-area data processing centers for the technically minded.

A two-day ACM management seminar on "The Profit Crisis" will be held at the Conrad Hilton [CW, July 13].

Twin Cities Testing New Urban Model Under U.S. Contract

LOS ANGELES—A computer model designed to predict the outcome of measures to improve the quality of city life is being demonstrated and evaluated in the seven-county Minneapolis-St. Paul metropolitan area in Minnesota through a contract administered by the Twin Cities Metropolitan Council.

This model, the Urban Performance Model (UPM), was formulated by Planning Research Corp. and developed under contract to the U.S. Department of Transportation.

The demonstration, expected to last nine months, is being conducted by members of the Systems Economics Dept. of PRC Systems Sciences Co., a Planning Research company.

The UPM can process data on transportation, housing, industry, schools, hospitals, parks, and other factors in urban life and has the aim of predicting the effects of changes in land use, facilities, and services in satisfying the needs of the urban dweller.

It is expected to be valuable for testing alternative decisions in the context of urban growth and change.

This demonstration for the Twin Cities Area will test the usefulness of the UPM to urban transportation planners and provide a real-life laboratory for other metropolitan planning organizations to assess the value of the UPM for their own planning activities.

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U.S. Supreme Court Simulated

System Accurately Predicts Decisions 91% of Time

By Edward J. Bride
CW Staff Writer

EAST LANSING, Mich. — Business, organizations, and lawyers contemplating taking cases to the U.S. Supreme Court can now have a computer prognosticator on their chances of winning.

A Michigan State University (MSU) political science professor has devised a model for Supreme Court decisions which is so effective he has predicted with 91% accuracy several important decisions this year, including the Pentagon Papers and the Muhammad Ali case.

The predictions were prepared for a newspaper column being test-marketed on the West Coast and aptly named "The Supreme Court Computer."

Dr. Harold J. Spaeth uses his model in class, too, for his course on the American judicial process. There are about six programs in the system, including two rank-correlation programs, a cluster-analysis program prepared independently from the Supreme Court system, two factor analysis programs, and some multi-dimensional scaling programs.

Written in Fortran IV, the programs occupy essentially all the core of a CDC 6500, about 115K bytes.

As a member of MSU's Computer Institute for Social Science Research, Spaeth had programming assistance (and free computer time) from the institute. He said the programs could be used independently (some are already in the public domain), but establishing the data base of almost 3,000 cases would present an additional research chore.

The monthly column will be syndicated by a company called R-Squared which already distributes Bud Goode's "Sports Computer."

He anticipates doing two columns a month next Supreme Court term and in spending this hiatus analyzing and collecting data on the past year's decisions. He analyzes mostly cases "in which the public has a special interest," he said, such as the 18-year old vote, poverty or busing issues.

"The Pentagon Papers was not scheduled for a column," he said, "but I did it because it was a hot item." In that decision, Spaeth predicted that freedom of the press would be upheld, but said it would probably be a unanimous decision.

While "hedging" that the vote could be 6-3, as it was, Spaeth was not perfectly correct in who would vote which way. His 91% accuracy is based on decisions, while he claims to have correctly predicted 81% of the individual justices' votes.

The predictions, he added, are based on which issue the court will select as the focal point. Each case may have as many as a half-dozen issues presented, he explained, but the court usually selects one constitutional item as the basis for its finding.

For example, freedom of written communications presented one area for argument in the Pentagon Papers, while national security presented the other. The correct 6-3 split, the "hedge," was used in case the court based its judgment on the failure of the government to establish a "clear and present danger" to security.

Choosing the issue is a "human" decision, not a computer one, Spaeth said, and this area is normally where the errors have occurred.

As to whether the program or the computer was at fault in these wrong decisions, Spaeth said, "The computer is only as good as data you feed into it, or the models applied to it."

"I can explain what I've learned from the inaccurate predictions: hindsight is a helluva lot better than foresight, as regards my judgment of issues and the extremity of the issues."

The fault was "not in the computer, not

in the program," he added. "The fault lies entirely with the analyst... me."

Size and speed of computing equipment presents an obstacle to the proliferation of this sort of system, Spaeth indicated, as does human nature.

The court is a human institution, he added, noting his success in forecasting its actions is rooted in psychology, not in statistics. He therefore rejected any idea that the third branch of government could be replaced by a judicial automation.

Spaeth uses three principles in denying the computer's future as a substitute judge:

- An individual's attitudes are established and endure from the time he assumes a place in adult society. When people change, however slightly, this affects the statistics and therefore the data

base.

- Human behavior is goal oriented, and a person will make decisions according to his personal policy preferences, unless prevented from doing so by a rule of the institution in which he is operating.

- To predict accurately a person's behavior, it is not enough to identify his policy preferences, but the character of those preferences must also be understood.

Spaeth works under the assumption that judicial behavior is no different from other types of human behavior, except for the limitations imposed by the rules of the court.

His program "lost" one case because of the above variables, he recalled. The obscenity case of "I Am Justice Blacklow" was computed before Justice Blackmun was nominated and therefore on the

basis of an eight-man court, although Blackmun did rule in that case.

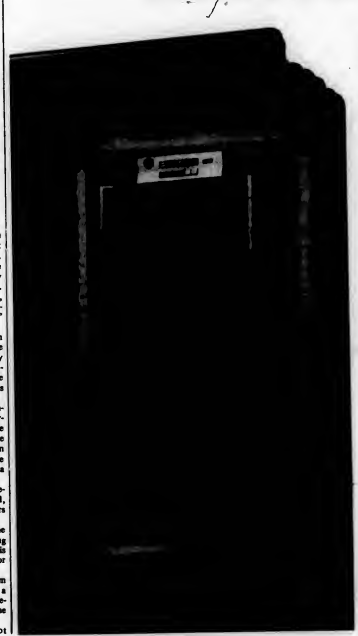
Then, writings of Justice Douglas were published in an underground magazine, and he disassociated himself from future cases involving Grove Press (which therefore took him out of the "Curious" case). In other words, Spaeth reiterated, "I predicted that case on variables I did not know would be variable."

Attorneys for both sides of a case could use his model, he stated, since the data base is a historic one and since justices of the Supreme Court can be consistent, as they owe no political favors.

"Every attorney is trying to psych-out the judge" and see what issue will be the basis of the decision, Spaeth commented. "I'm just doing it in a scientific fashion."

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AMPEREX

Comments Sought on NBS Cobol

(Continued from Page 1)

Federal Standard Cobol consists of four alternative combinations of the modules specified by ANSI. These combinations would be known as low, low-intermediate, high-intermediate and high level implementations. Each consists of the high or low level nucleus, and selected levels of six of the seven FFLs of the ANSI standard.

Compilers required by the government or used by outside suppliers after June, 1972, would have to be identified as implementing one of the levels of the Federal Standard. Compilers would have to contain all of the language elements of the identified level.

A compiler may include elements beyond those of the identified level. These might be either higher level ANSI specifications or extensions beyond ANSI.

ANSI Levels ANSI Modules	Low		Low-Intermediate		High-Intermediate		High	
	Low	High	Low	High	Low	High	Low	High
Nucleus	Low	High	Low	High	Low	High	Low	High
FFM	Low	Intermediate	Intermediate	High	High	High	High	High
Table Handling	Low	Intermediate	Intermediate	High	High	High	High	High
Sequential Access	Low	Intermediate	Intermediate	High	High	High	High	High
Random Access	Low	Intermediate	Intermediate	High	High	High	High	High
Sort	Low	Intermediate	Intermediate	High	High	High	High	High
Segmentation	Low	Intermediate	Intermediate	High	High	High	High	High
Library	Low	Intermediate	Intermediate	High	High	High	High	High

Each of the levels of the proposed Federal Standard Cobol includes a different pattern of ANSI Cobol Nucleus and Functional Processing Module implementations.

To ease the transferability of programs between CPUs using the same Cobol level, however, the additional elements should not normally be used. When they are used, the additional elements would be automatically flagged on a source program listing generated by either the compiler or a precompiler.

With such a flagged listing, users would be immediately aware of program sections that might not be transferable, NBS explained.

Comments on the Federal Standard Cobol proposal should be addressed to the director, NBS Center for Computer Science and Technology, Washington, D.C., 20234, by Aug. 27.

Users Asked to Cut Power Use

(Continued from Page 1)

some of the actions DP managers could take in order to comply with it.

The board called on industrial power users to review each power conservation measure with electric power suppliers and to check that the measures are con-

sistent with government and local statutes.

Maintain Equipment

Additional recommendations include keeping equipment in top operating condition so not to cause unusual or fluctuating power draws, and converting to higher voltage feeders (220 or 440) where practical, especially in considering plans for new facilities.

"In special cases as in cooperation with your utility," the report continued, "consider use of emergency standby generators during peak load periods."

Starting air conditioning equipment an hour early and making the temperature cooler at first will reduce power demands during peak start-up periods of other businesses.

A reduction in ventilating air can result in a "substantial power savings," the report added.

When spaces or buildings are unoccupied on weekends, air conditioning should be turned

off or to a warmer setting. This applies to shifts during the week when the system isn't scheduled for use.

While Staw said "certain areas of the country" are "marginal in electrical power generating capacity," other studies have indicated that only the area west of the Rocky Mountains are considered to have adequate reserves.

Still other studies have shown that efficient electrical power does exist in the nation as a whole, but that the means for transferring this power do not exist, so that one area can have comfortable reserves while a nearby city may be experiencing a brownout.

Computer users are in especially perilous situations when line fluctuations occur, when these fluctuations are supplemented by 55-65% voltage drops. The resultant decrease in voltage at the computer would bring the equipment outside the warranted 95-105% variances provided by most DP manufacturers.

DP Personnel Shortage Denied by New Zealand

WASHINGTON, D.C. — New Zealand officials here denied last week that their country has a shortage of data processing personnel.

Inquiries from American DP people interested in emigrating to the island began pouring into New Zealand offices in the U.S. after the president of the New Zealand Computer Society was

DP Keeps Track of Fires

ALBANY, Ore. — The local fire department compiles fire statistics by computer, with the figures being used for training and planning. The statistics, which replace manually prepared forms, denote the nature and number of fires, their origin, casualties caused, and length of time taken to extinguish them. There are other figures, too, such as length of hose used, and size of the buildings.

quoted as saying there was an acute shortage (CW, June 30).

"Experience with the placement of immigrants under the current New Zealand immigration scheme indicates that there is at present no widespread search by New Zealand employers for overseas computer personnel," New Zealand Minister R.L. Jernyn said.

Shave Employment Service in Auckland told one American looking for a position that there is no shortage and that DP salaries range from \$4,000 to \$6,000.

Jernyn said although he didn't want to discourage an interest in emigrating to New Zealand, he wanted to make it clear emigrants should not expect to readily find a well-paying job as a programmer or analyst upon arrival.

News Wrapup

Eastern DP Taxes Drop by One-Third

MIAMI — Eastern Airlines (EAL) and the Metropolitan Dade County Council have agreed that computer system "intangibles," software, services and training, are worth about a third of the manufacturer's list price, and EAL's property taxes will be reduced accordingly.

An Eastern statement said the original and supplemental 1969 equipment brought the catalog price to almost \$9.5 million, and the untaxable intangibles amounted to \$3.2 million. That brought the total figure of depreciable property, hardware, to about \$6.3 million.

Future taxes will be based on the compromise evaluation. Allowing for depreciation, the 1970 assessment, for example, will be based on a value of \$4.9 million, not the original \$6.7 million assessed by the county, he said.

Included in the software were both systems and applications programs, as EAL procured its equipment prior to the IBM unbundling. The airline has three 360/65s in its reservations center here, and is currently building a new center to house a 195.

DP Crime Study May Boost Public Interest

KANSAS CITY, Mo. — A "more active general public interest" in law enforcement improvement has been cited as one potential advantage of a computerized study of last year's crime picture. Arthur Benson, executive director of the city's Criminal Justice Study Commission, said seven million items of information were culled from over 3,000 cases, and teams of lawyers are analyzing the data to evaluate the effectiveness of the justice system.

The commission plans to make recommendations to the state's legislature and to municipalities, and to inform the state Supreme Court "in some instances where present rules would be affected," said Patrick D. Kelly, chairman of the commission.

Georgia to Ketch Medicaid Fees, Diagnoses

ATLANTA, Ga. — The use of computers to match standard medical fees and procedures with diagnoses is being evaluated as one method of cutting state Medicaid expenditures. Called "peer review," the system is on six-month trial, and calls for review of any Medicaid bills when they deviate from the norm. The reviews are conducted by physicians and other providers of medical services to the poor.

State physicians interviewed by the *Atlanta Journal-Constitution* were in unanimous approval of the experiment, which began July 1. While proponents admit it is not the final answer to keeping costs manageable, immediate savings are anticipated from state expenditures to pharmacies, hospitals and nursing homes, in addition to doctors.

DP to Help Assess Family Planning Needs

LANSING, Mich. — Local family planning centers will soon be submitting socioeconomic data in a uniform, computer-compatible format to the state's Center for Health Statistics, in an effort to provide a more accurate and comprehensive picture of family planning needs and services.

The plan, which took a year and a half to develop, was designed to determine how effectively the state is meeting these needs among its 180,000 poor women. Under the system, family planning workers will have just one form to fill out, instead of up to 15 in use previously. Data will be confidential, with no names getting beyond the local office, the system designers said.

County Expects System to Hasten Trials

JACKSONVILLE, Fla. — Duval County, which claims the best record in the state for getting speedy trials, anticipates an improvement in the state by running a court management system on this city's computers.

Circuit Court Judge Everett Richardson, project director, said the system would "provide the rest of the state with a model," and that it would further decrease the backlog of criminal cases and the processing time from arrest to disposition of a case.

Program Couldn't Handle Perfect Papers

BUFFALO — "Perfect" test papers meant "perfectly stupid" students to the computer program used to grade some junior high school students in nearby Tonawanda school district. The papers involving grades of "100" were recorded as "00" in the computer, because of an instruction limiting the test-grade field to two digits. Following that instruction, the computer "failed" students with too many "perfect" examinations. Corrected report cards were sent out by the district, and vacation is proceeding as normal.

Thanks to local headlines reading "The Computer Flunked," anxious parents of the youngsters have a "computer error" to discuss.

What's This-A Guaranteed Tee Off Time?

NEW YORK — Wonder if you'll get up at 4 a.m. Saturday to beat the crowd at the local course only to find a long line of cars now ahead of you? Take heed, Golfers in Westchester County can now receive guaranteed tee-off times at the Dunwoodie course in Yonkers through Ticketron offices in New York. Plans call for the service to be expanded to include other courses in Westchester.

COMPUTERWORLD

THE NEW YORK TIMES MAGAZINE

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"200 tracks/surface, 20 surfaces/pack, 2.5-megabit transfer rate, 2400-rpm rotational speed..." Those are the specifications an independent must meet to be pack interchangeable with the IBM 2314.

Meeting them wasn't difficult; several companies did. But only Century Data took the basic function and improved the technology across the board. For example:

The CDS-214 is a two-high unit that stores 466 megabits in half the floor space. It has a unique electromagnetic head-positioning system — without mechanical pawls, detents, or gears — that gives faster access time (65 msec compared to a competitor's 80 msec). All common logic is packaged on a common board, so the end result is one-third as many boards — and MTTR is reduced to a 1-hour maximum (compared to a competitor's 1.5 hours). And, an off-line checkout exerciser quickly isolates problems without tying up the controller.

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IBM's Fixed Term Leases

Are They 16% Off Cost or 20% Over Market Price?

One of the biggest problems in pricing is often to determine the value of a product. List prices are all very well, but you can be misled by them. In many instances the true price is something very different from the sticker price.

The computer industry has some problems of its own in this way. Perhaps the major problem is the fact that, being in a near-monopoly situation, the only firm price generally known is the one put on the product by the hardware manufacturer.

True, there are alternatives such as the competitive plug-for-plug systems which can be put side-by-side and the prices compared. But there are problems in this approach also.

What is the additional value to be ascribed to a faster access time? Or the decrease in value involved in potentially having two sets of maintenance problems?

List Prices Doubles

Moreover, the problems with those list prices that seem to exist in the computer industry increase because of special bargains and other techniques for meeting marketing competition that can be found.

It is not certain that the list price is the one many people pay when they really shop around.

The same holds true in the user computer market (which is beginning to grow at last). Here it is certainly clear that the hardware involved is the same, and the maintenance involved may well be the same, so that simplifies matters.

But the price you are quoted may be high or low — there just

is not even as good a general set of evaluations on our hundreds of thousands of dollars worth of computer equipment as there is in your paper on the price of brown eggs in your local market!

Lease Analysis

It was when I was faced with this problem of trying to evaluate the situation with regard to IBM's fixed term lease plan (and its maximum 16% "savings" contrasted with those horrendous termination charges) that I ended up with the general advice to users that I felt that they should be looking elsewhere than IBM as a supplier of their hardware.

I just felt that if IBM believed it necessary, from a marketing point of view, to ask a user to risk more money than he could save on his basic 176 hours of the agreement, then something stank. And I still believe this.

But, I was not able at that time to say anything further because of the very difficulties in pricing that exist in the industry. That's the often the life of a columnist.

Was 16% Saving Real?

Personally, I had done some checking around, and had found that in fact the same terms IBM was offering were available elsewhere.

In fact I found in many cases the peripherals involved could be obtained at about a saving of about 35% on IBM's figures, as opposed to the 16% it was offering.

This indicated that far from being a saving, the fixed term lease really could be a mid-20% premium price that the IBM user had to pay over market value of his equipment, just for the privilege of getting it from one particular salesman.

But I did not talk about this, because I was not able to document it easily. This is one of the bane of a commentator's life, knowing data, but also knowing that pure knowledge is not enough.

There is, however, every now and then, something that almost makes up for this frustrating fact of life. That is when, by some completely unexpected happenstance, the necessary data appears ready for you to use. And it happens more often than you might expect.

It has happened in this case. It turns out that just after my article appeared, IBM was doing some more thinking about the problem of how to save the sale of some of its peripherals.

In particular the problem involved some 2314s, 2401 tape drives, disk drive controllers, together with Model 30 computers.

These peripherals were wanted by the Army, but the Army had started looking elsewhere. IBM, therefore, recognizing the true facts of the marketplace, came in with some new bids.

\$13 Million Cut Offered

IBM's original bids, including maintenance, were apparently for \$35 million over five years.

The new bid, including maintenance, and including installment payments of the systems over the five years, only amounted to \$22 million. (There was a further bid, for immediate purchase, at \$18 million, but we are not so concerned with that at the moment).

So, while IBM was trying to get users' signatures on these nice fixed term contracts, on the claim that the rental price was 16% below that which the user would otherwise pay, in the market-place, much of this same equipment has a value of 37% less than the IBM list.

So, Premium Ranges 20% — 30%

That means that IBM basically was recognizing the fact that in the market-place the price it is asking its rental customers to pay — its very best price — is not really 16% on the going rate, but instead somewhere between 20% and 33% premium over market! (The range depends upon the

Time Charges, Tariff Barrier

Objections have been raised to my omitting the problem of extra time charges in my original analysis of the fixed term. There is some validity to the objection, because if you are using a three-shift operation or otherwise incurring major additional charges, a fixed term rate does help you in avoiding them.

However you could have already eliminated these simply by leasing the system from a third party. The extra time charges have in fact been eliminated in the open market for some years now. As such, the comparison to marketing conditions, as opposed to a comparison simply with IBM contracts, would suggest that this is not a particularly solid area for the IBM representative to stand on.

With regard to my idea that the termination charges make the whole thing into a tariff barrier around users' installations, it has been pointed out that there is really a gap in the tariff barrier every two years.

The argument has been made then that the installation can simply synchronize the gap to the time that it is ready to start looking around.

This is again partly true, but on the other hand there is a gap for each particular peripheral involved.

At the current time, when people have signed up for all of their peripherals as from June 1, these gaps may be synchronized (and be nearly two years away). However, as they sign up for items that get delivered in the future, the gaps will get out of synchronization and the time when it is good to replace two of your tape drives, will be bad to replace the collector, etc.

method of calculation. If you take the original IBM rental price as being \$100, then the maximum discount 16% brings it to \$84. The 37% offered by IBM in its intermediate bid knocks the \$100 down to \$63. The difference is then 21% of the original \$100, or 33% of the low, \$63, price.)

Now that is what I would call very nice of IBM — putting out such an offer just when I needed the details to flesh out the story that I had previously written.

Similarly, I would like to thank the IBM spokesman who said, "We recognize this is a very competitive market. We are trying to be responsive."

I know that IBM is trying to be responsive to the market conditions — but I think it would be a little bit fairer to its rental customers, if it responded to conditions by putting its prices at competitive figures, instead of trying to win the battle with a

mixture of legal fine print and salesmanship.

And, as far as the users are concerned, I think the present situation clearly indicates the fixed term agreements should not be signed, except after determining that the outside market cannot supply your needs. Equally, they should not be renewed without such a lack of availability being redetermined.

If this is done on a reasonable scale, perhaps that big chunk of money that is involved — even if it is only 20% — can be redistributed inside or outside the IBM operation in such a way as to more effectively help the user concerned than by paying it over our industry's big brother.

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Letters to the Editor

Anyone Have I-Sort Code?

I read with interest and completely agree with The Taylor Report concerning the "Sort Dilemma" [CW, June 16]. We conducted our own analysis of SM1, Sort 483 and I-Sort and found I-Sort comparable with SM1. Sort 483 was found to be about 10% slower than the other sorts.

I-Sort seems to be a modified D-Sort with 2314 support. The control cards are similar as are the diagnostic messages. We chose to remain with a package we knew was not supported to gain increased throughput. At present 90% of our sort applications use I-Sort and are pleased with its performance.

However, DOS release 24 and above will not support I-Sort in the form we have it (object decks). We have considered converting to Sort 483 or SM1 but feel one is too slow and the other too costly.

Taylor mentioned a support group for D-Sort. I am strongly in favor of a group of this nature, but I would suggest in-

creasing its scope to include I-Sort. In doing this the group would be broadened since D-Sort will not support a 2314.

I am presently searching for a copy of the I-Sort source code. If anyone has access to such code I would appreciate being contacted as soon as possible.

In the future, I will be more than happy to provide any of my personal time to the support group. As I have been involved with installations using D-Sort, such service will be a welcomed alternative to the "Sort Dilemma."

R.B. Lemker, Coordinator

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Dropped Charges 'Significant'

The Taylor Report was a very misleading and slanted article on IBM's new fixed term leases [CW, June 23]. The table showed results for only two year

lease, and one reading the table would get the opinion that the break-even point is in the sixth quarter when in fact it is in the thirteenth month.

Taylor also bases his reasoning on thinking that a user doesn't have any idea how long he is going to need a piece of equipment. Most users do have well thought-out plans and consider penalties.

The most glaring error in the article was that Taylor completely overlooked the effect of the overtime charges that IBM has dropped in the next fixed-term leases. The latter can be extremely significant since some users spend an additional 20% to 30% per month in overtime. Figuring in the overtime can bring the break-even point to just seven or eight months. In other words, the user would start to profit from that time forward.

L. Prince

Corporate Computing Facility
The Perkins-Elmer Corp.
Norwalk, Conn.

Upgrading Soon as Costly

The Taylor Report on the new IBM contracts was correct [CW, June 23], however he did not mention another particular issue indicating that users are penalized even when they upgrade to other IBM equipment prior to the termination on the contract.

They aren't even good to those who are faithful to the cause. There are definitely better lease contracts available and many of these OEM companies have the equipment that is equal to or better than comparable IBM equipment.

The marketplace is getting to be very interesting with the genuine competition that IBM has today. It gives the user a choice, something that he has never really had before. And this can't be anything but good for the industry.

John E. Callahan, CDP
Manager, EDP Technical Support
Genesco
Nashville, Tenn.

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New Afips President Says

DP Personification Can Be Good

By Edward J. Brice

CW staff writer
CAMBRIDGE, Mass. — Public personification of computers can be good.

It promotes acceptance of technology, as long as the systems work well and don't "forget" or "make mistakes," according to Keith Uncapher, the new president of the American Federation of Information Processing Societies (Afips).

Computer users often personify their machines by thinking "the computer updates" or "the computer corrects," Uncapher said.

The public also personifies the machines, but the citizenry usually recalls how the computer "forgot" or "made a mistake" whenever a program was at fault or an input device malfunctioned or an operator made an error.

By designing "human values" into systems, Uncapher commented, and by simplifying these systems, the public can learn to accept computer technology.

The assistant head of the Computer Department at Rand Corporation, Uncapher said the best

way to bring this public acceptance may be by bringing digital technology to the public in the form of "kits" on a hobby level.

If the public can be made to understand the capabilities and limitations of technology, and if computers can be made more simple and reliable, then public attitudes will change positively, Uncapher suggested.

Noting computer applications are often "pervasive, both in visible and invisible ways" to the general public, Uncapher believes kits may be the best way to effect general comprehension.

The production and sale of such hobby-level items would have a "profit-oriented," he admitted, but this should not detract from their usefulness in achieving educational goals.

Viability, Simplicity

While the viability — the kits — would educate the general public, he agreed that simplicity will probably benefit the users. The user community is now beginning to trust "soft" information, such as the displays on cathode ray tubes, Uncapher observed.

This phenomenon is an outgrowth of extensive computer usage, a "natural reaction that users are trusting data on a screen without feeling the print-out paper," he commented.

It is also an outgrowth of the simplicity common in on-line systems, where the interface is not painstaking or time-consuming.

"There is no going back to the old way," he mused, adding there must be improvements in programming language for users, and more simplicity for nontechnical people utilizing such tools as point-of-sale recorders.

The development of better, simpler data processing tools hinges largely on the health of the economy, since any company's "level of innovation" is a function of competition, Uncapher observed.

Industry Failure Rate

Disturbed by the current depression in the economy, he stated the "failure rate in our industry is still not diminishing."

Uncapher, who does not claim to be an economic expert, said he does not share the optimism of some of the West Coast companies which foresee good times in the short or mid-term. The picture painted by his business colleagues is "not a good one," he said.

"This is especially painful because there is usually a high level of creativity" in small companies, which have been prone

to failure in recent months. Uncapher assumed the Afips presidency while on a whirlwind tour of the country, visiting the federation's various local committee chairmen and some of Rand's regional installations.

A major portion of Rand's theoretical and applied computer research comes under his review, including time-shared research, the development of graphical languages and related input devices, and basic theoretical research related to computer technology.

He actually "succeeded" to his present post, having served two terms as vice-president under Dr. Richard I. Tanaka.

Multiple-Update Programs Cause Public Confusion

TRENTON, N.J. — An laboratory research resulted in thousands of extra pieces of mail being sent to New Jersey drivers.

Some newspaper reporters duplicated a license were being sent to "baffled motorists with license-stuffed mailboxes," but an official at the Department of Vehicles denied this had occurred.

What had been sent, said DP manager Ed Colyer, were additional acknowledgments of changes of address to motorists with two different licenses, automobile and motorcycle, for example.

All Files Updated

Colyer explained that the address-change program automatically updated addresses in all files, even if the motorist only sent in one change notice. The duplicate acknowledgment of the change was automatic but, since it caused so much confusion, the routine was patched out of the program.

Now, a single change notification by a motorist results in only one update, so he must submit a change of address for each type of license he holds.

Lower Jail Costs Seen

PHILADELPHIA — A saving of more than \$3 million a year in jail costs through the use of video terminals by local courts in criminal action should be bailed or released on personal recognizance has been predicted.

The terminals are used as part of Philadelphia's judicial administration program. Defendants' records are transmitted from the city hall computer to the video terminals in judges' chambers.

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1. Incompatibilities in System 3.

If you want to extend the use of your System 3, what are the hardware and software limitations? Come to **COMMON** and listen to problems—and solutions—of other users. What improvements can we demand from IBM?

2. DOS. Can It Really be Emulated on the 370?????

On the surface it looks like a great way to upgrade your system, but—who has tried it, and what do they say? What does the documentation look like? What has to be done before it is fully workable?

3. Problems in Systems Control Programs

Why should we pay for computer time that is used to identify—and correct—IBM's software problems?

4. What About the New SCP's for the System 3, 370, and Others?

5. Microcode, When, Where, and How?

Will microcode be used for some SCP functions? Will it be used in our small machines?

6. System 7.

Can it be used only as a sensor based device or is it possible to use as a stand alone processor for special jobs?

7. FORTRAN and COBOL on Small Machines

What has to be done to make FORTRAN and COBOL compatible across all small systems? What will this imply for user management?

8. Data Base Management, What's New for the Small User?

How will the new data base management systems affect you? When, where, and how should you use them?

9. Patents, What Are Your Liabilities?

Software has been patented, and every user should know of the potential liabilities he may incur if some patents are upheld.

Don't be a no-show! Don't be a non-voter! Don't be one of the silent majority! Come to COMMON and let's get some action from IBM!

If you're still not convinced that **COMMON** is for you, then phone Ken Conrade—Gibbs and Hill, Inc.—(212) 565-4300 for more details. Better still, though, register on August 8th or 9th and come—in person—to sound off!

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Groups Mulling 'Common' Confederation

By Edward J. Brider
CW Staff Writer

NEW YORK — One of the first user groups endorsed by IBM is preparing to raise "some interesting questions" of the industry leader, and the questions may very well turn into a confrontation when "Common" meets here next month.

An organizational meeting will include proposals to form a confederation with unaffiliated local and special interest user groups, so these groups can get the same benefits from IBM as members of Common (users of small IBM machines like the 1130, 360/20

and 30, or System/3).

IBM has been presented a list of the questions, and Common said one issue was changing the design of software which con-

Societies/User Groups

trols meters for individual devices, like 360 tape drives.

The meters apparently run when the CPU is operating, even if the devices are not being used, resulting in possible overtime charges for machines which have not been actually used in excess of the basic shift allowed.

This problem is reduced, however, with IBM's new long-term leases, which have eliminated some of the overtime.

Other agenda items include the use of S/3 as a remote job entry device, or as "anything other than a stand-alone card processor with disk storage."

A question on System Control Programs stems from the apparent release of SCPs. Common President Larry H. Baker said, resulting in "lost machine time and poorer performance." The question: Should the customers pay for computer time used to "identify and correct IBM software problems?"

Officials of all known IBM user groups have been invited to attend the Aug. 9 organizational meeting. Baker reported, and about half of the 20-odd organizations have shown interest in confederation. He said he expected 700-800 people to attend the full convention Aug. 9-11.

Other matters presented to IBM for discussion are the future use of microcode, and Fortran and Cobol compatibility across "all small IBM machines being examined."

The meeting is not restricted to IBM users, and a \$45 registration fee is common to members and non-members alike.

More information is available from Ken Conrade, Gibbs & Hill Inc., 393 7th Ave., 10001.

Health, Welfare 'Failure' Cited

MINNEAPOLIS — The use of computers for health care delivery is a "dismal failure," but alternatives and the real needs of the public will be topics of discussion at the third annual meeting of the National Association for State Information Systems (Nasis), to be held here Aug. 16-18.

Among other topical discussions will be panels on welfare systems, communications, the coordination of education institutions, and law enforcement and criminal justice.

A joint meeting with the National Legislative Council will take place Aug. 17 at the Radisson Hotel, but all other conference events will occur at the Lemington Hotel.

Policy topics will include the role of the central agency, state and local systems, and federal participation.

Information is available from Mrs. Patsy Anderson, Council of State Governments, Iron Works Pike, Lexington, Ky., 40505.

New 'Guidance' Chapter

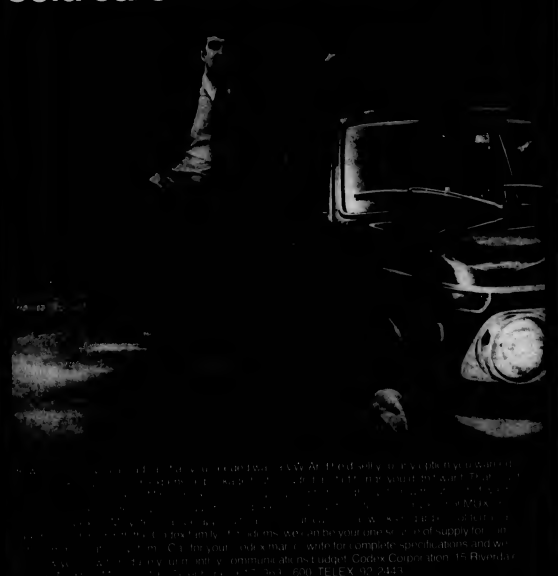
PHILADELPHIA — Guidance International, the latest IBM user group to be "sanctioned" by the company, has finalized plans to form a chapter here.

Officers will be appointed by a nominating committee from international headquarters when the local group convenes in September.

Other chapters are being contemplated for Westchester and Rochester, N.Y., Chicago, and Hickory, N.C.

Information is available from Box 537, Lake Ronkonkoma, N.Y., 11779.

If our multiplexer salesman sold cars he'd be a loser.

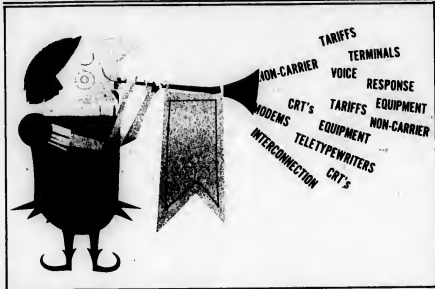


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Supplement/1



Data Changes Often Hinder Improvements

With the many changes that almost daily affect data communications, the user seldom has time to take stock of his planned or existing network. This supplement spotlights subjects often overlooked but important to data users.

Communications requirements cannot be filled from a standard catalog. Each network is different. Whether a user communicates with one branch on the other side of town or talks to dozens of remote terminal sites around the country, he usually configures a unique network designed to solve his unique requirements.

Included in such network de-

sign problems, or the updating of existing networks are many trade-offs, all of which can lead to the most efficient operation if the user makes the right choices. There is the question of using Bell modems versus non-Bell equipment which opens up the whole can of interconnection worms that the user must digest. And the new specialized carriers — will they offer services soon enough to be of value?

And what about those mystical tariffs and regulations? Most users know they affect that important monthly phone bill, but getting involved in regulatory procedures is something else.

(Continued on Page S/8)

Specialized Carriers Still 1-3 Years Away for Users

MCI Network Offers Users Customized Data Services

By Ronald A. Frank
CW Technical News Editor
WASHINGTON, D.C. — Microwave Communications Inc., the company which started the whole idea, plans a nationwide network serving 41 states with point-to-point services that can be tailored to the data user's exact needs.

The MCI network will consist of regional microwave links operated by individual companies much like the operating companies of the Bell System. Coordinating the operations of these affiliates is Microwave Communications of America

(Micom), which will assure that all the separate regional links form a compatible interconnected network.

The first link from Chicago to St. Louis is currently in a system test acceptance phase and the first data users are scheduled to begin operating by fall. Additional links could be constructed in as little as nine months from the date of final FCC approval. (Each link is being considered separately by the commission.) MCI could be in coast-to-coast service by the fall of 1972, according to current estimates.

MCI will provide both analog and digital services to users. In addition it will offer one-way, two-way, and shared facilities and many of its offerings are not available from Bell today.

The new carrier will eventually offer end-to-end service to subscribers by means of local loops that will probably be short range microwave systems located on rooftops. But until the proposal gets final FCC approval (it is currently under study), MCI will lease its local loops from the phone company to get users on the air without delay.

Although exact cost comparisons are difficult because Bell

Now that the FCC has basically approved the entry of the new specialized common carriers into the communications service arena, data users are wondering what to expect from these new companies.

How soon will the new services be available? How will they compare with current Bell System rates? What types of services will be offered?

In order to answer these questions, CW talked with MCI and Datran, the two largest of the new carriers for this analysis.

does not have comparable rates for many of the MCI offerings, users can expect rates that are 50% cheaper than present phone tariffs.

In one example, a data user operating a CRT from a remote site to a 360 CPU equipped with a 2701 line adapter could access his central site at 150 bit/sec while the CPU could answer the CRT terminal at 9,600 bit/sec.

The slower CRT-to-CPU line would cost about eight cents per mile while the high speed CPU-to-CRT link would be \$1.35 per mile. Total costs without local loops would be about \$420.

A similar capability from Bell with leased lines would cost about \$850 including modem and line conditioning for the high speed line. Although the Bell price also includes local loops the potential savings to users will be significant.

Datran Digital System Favors Computer Communications

By a CW Staff Writer
VIENNA, Va. — The Data Transmission Co. (Datran) will provide an all digital end-to-end system specifically designed to serve data users. It will carry no voice traffic.

Because it is a self-contained network, Datran plans to throw the big switch on its entire system all at once. Although current estimates mention a 30-month construction period most spokesmen here firmly quote the first quarter of 1974 as the start-up date.

Datran will offer switched service similar to the dial-up phone network which users will access through a seven-digit address much like a telephone number. The first three digits will route a user call to one of 35 regions similar to AT&T's area codes.

The new carrier will offer data rates of 140, 4,800, 9,600, and 14.4 kbit/sec at rates that are described as "60% less than existing carriers."

The key to Datran service will be a required terminal called a Digital Communications Console (DCC) which will rent for "about \$15/mo." Datran officials say the DCC will have simple controls and will be the only device between the user's ter-

minal and the Datran network. With its computer-controlled switching centers, Datran subscribers will get some unusual services. As an example, the local Datran office could transmit to a user a list of callers who attempted to reach him while he was busy, or a "paging mode" could restrict outgoing calls only to certain approved areas.

The DCC will allow users some self-testing capabilities to minimize trouble calls and allow line testing from the user's site, without carrier personnel, whenever possible.

Although Datran proposes to provide end-to-end service, the local loop question is still not resolved by the FCC. The new carrier may at first supply such loops with leased phone lines.

But before you sign up for Datran service you will have to wait a while. The carrier says it will not take orders until 12 months before service is scheduled to begin.

Meanwhile the FCC is working to give Datran the final go-ahead to begin construction. And although some technical and economic matters remain to be resolved, the final okay is expected soon according to an FCC source.

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Design Services Can Optimize Communication Nets

By Don Levitt
CW Staff Writer

Designing a telecommunications network, including placement of terminals, multiplexers and central CPU, is apparently too complex to be handled effectively in-house except by large data users. But several services have been developed to handle the problem.

Some of these services include on-site consultation and study

by outside organizations. Others provide time-shared data bases and programs which the user can access on his own.

One of the most comprehensive services is the Management Assistance Plan for Telecommunications (Map/TP) from International Telecontrol Corp., Wilmington, Del. Map/TP can start with basic teleprocessing sessions for management, in the system analysis and design

phase, Map/TP can include studies of requirements and of computer/communications specifications. The definition of request for proposals and the evaluation of the vendor's responses can be included, the company said.

Less ambitious is the Compute library of system information and design programs developed by and available on the time-sharing network through Berglund Associates, Cherry Hill, N.J.

The library includes programs for least-cost data communications systems design; for routine system design calculations and for retrieval of information on data rates and tariffs.

The designer can determine where to locate a remote multiplexer or concentrator so that

the total cost of lines is the lowest possible, by using the Lomax program.

Among the design calculation programs is one that computes and prints mileage and service terminal costs for most single or multiple segment Bell private line services.

The Network Audit service combines Berglund personnel with the capabilities of the Compute library, to pinpoint ways of cutting costs, improving the network's effectiveness or both.

The Netnet analysis service on the Interactive Sciences Corp., and other time-sharing networks, can be used to study direct wire, time-division multiplexing, frequency-division multiplexing and multiple WATS networks, according to the developer, Digital

Systems Corp., Hanover, N.J.

Netnet allows the user to enter his locations in conventional geographic terms, which are converted internally to the Bell V and H coordinates.

Using Netnet, the communications designer can reduce excess capabilities, reroute paths for special considerations, optimize line loadings for a desired response time, and test each change.

Under the Tolls program, available on several time-sharing networks through Computera Inc., Braintree, Mass., the user is able to determine the interconnect links, mileages and charges.

Tolls will accommodate 60/75 baud, 100 baud, 150 baud and voice grade codes in both full and half duplex mode, the company said.

On-Line Plotters Gain Favor Among Data Users

By Robert J. Cowan
Special to Computerworld

Although incremental plotting generally requires a great amount of data input, i.e. one "word" per increment, compacted data coding techniques combined with "intelligent" controllers have greatly reduced data input requirements.

Hoars and Company, a London stock brokerage firm, provides a teletypewriter/ploter service. A user has the ability to request stereotyped formatted data relating to certain listed companies. The user then can analyze the data with respect to standard financial parameters.

The Texas Highway Department (THD) uses a remotely located plotter to provide highway design data when time becomes critical. The THD data processing service computer system is located in Austin, with remote terminals set up in the Houston urban office.

An operator in Houston who has an engineering problem takes it to the data processing center. Center personnel then send a TWX message to the Austin master control, where the inputs are fed into the IBM System/360. If time is not an extremely critical factor, a fast printout is produced and sent by return mail.

When a faster answer is needed, the computer output tape is mounted on a tape drive which is attached to a Bell data. The coded plotter information is sent over leased telephone lines to the dataset receiving unit in Austin, which is attached to a CalComp plotter.

The plotter quickly produces the required map or drawing, and the user walks away with his copy in a matter of minutes.

Automatic drafting has been shown to be a useful application with a teletype/ploter system. Ford Motor Co. has used a system of this type to design and produce detailed drawings of automotive valves. A typical plot can be produced in 40 minutes of plotter time. Using a GE 265, the CPU time was only 7 minutes.

Plotters operating over communications lines are available in two basic types:

- Analog XY Recorders - These units have decoding circuits and digital-to-analog converters. They are normally interfaced to low-speed keyboard printing terminals.

- Digital Plotters - These plotters operate directly from digital information. They can operate with most keyboard printers at low speed or without printers at speeds up to 2400 bit/sec (400 increments/second).

A new, more sophisticated remote plotting system has recently been developed. Called the Remote Job Entry (RJE)/Graphics system, it is able to operate as a terminal at locations remote from the CPU while at the same time providing hard-copy high quality graphics output. RJE/Graphics systems are used for applications requiring the power of a large CPU and the quality of a digital plotter.

As computer centers serve more widely dispersed users, one can look for more applications for remote on-line systems. Robert J. Cowan is marketing product line manager with California Computer Products, Inc., Anaheim, Calif.

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More User Participation Urged in Regulatory Matters

By D. Edwin Winslow
Special to Computerworld

The world of public utility regulation is an arena most computer personnel know little about, and perhaps accept.

It is fallacious, however, to assume there is nothing individual computer firms, or associations of such firms, can do about their communications rates.

The results of public utility regulation in each of the 48 states are as varied as the states themselves. Although all rate cases appear similar, the issues and results depend on economic variables ranging from economic analysis to behind the scenes political machinations.

Without participation, your interests are largely unrepresented by the Public Utility Commission (PUC) in your state.

If communications rates — the charges you pay for communications lines and terminal equipment — are significant to your present or future growth, you must actively participate in hearings which affect your rates and charges.

In most regulatory commissions the establishment of rates is more an art than a science. Anybody can participate in the art if they are a legitimate user of the public utility service offered.

Those who are successful in making their wishes known before a PUC, however, must speedily learn the skills and techniques of the old masters — in order to gain consideration of their views.

The name of the game under public utility regulation is for the telephone company to request an overall increase in their total revenues based on a claim that the rate of return on their total investment is not adequate to keep the utility in operation.

The assumption apparently made by communications users (largely through the lack of information rather than because of

specific information) is that PUC is the watchdog for the communications-using public and has within its possessions all information necessary to certify just and reasonable rates. This is not the case.

The PUC in any state is generally under-manned, overburdened and underpaid. Their job consists largely of attempting to develop a factual base upon which the decisions of the commission will be made.

They face a frontal assault by telephone company personnel (using money obtained from the very rate payers who may be adversely affected) who have probably spent 9- to 12 months in preparing masses of data, spent thousands of man-hours, and substantial money with their sole goal being the establishment of profit (that increased rates are necessary).

In addition, PUC staff face a hoard of outside experts who will testify under oath as to the validity of the telephone company's case.

In the face of this onslaught the troops assigned by the PUC (maybe from two to ten in number) are probably dividing their time between communications, electric power, transportation, and other public utility rate cases which are being conducted simultaneously. The battle is, at best, unbalanced.

Computer firms that have similarities in their communications interests can band together to form an association to assert in force before the PUC in a rate case.

The telephone company, when faced with such opposition, will seek to negotiate those increases in rates which affect the intervening parties. The reason is that the rates established for Bell services by the telephone companies are predicated almost completely on what they call "value of service" considerations.

Since they do not know how

much it costs them to supply individual services (i.e., residential or business telephone, private lines, audio, video, etc.), rates are established by subjective evaluations of each market by telephone company officials.

Participate to Protect Interests

Either singly or with a group you must become an active intervenor in a rate case to protect your interests. It is not enough however to enter a case and simply state your opposition to a rate increase.

Every user can be expected to oppose higher rates — the problem lies in demonstrating to the PUC why the proposed rates are not just and reasonable, why they contain elements of undue

discrimination, and why they are not in the public interest.

The burden of proof that the rates are just and reasonable rests entirely with the telephone company.

You must rapidly assemble a small team of experts (usually an attorney and an economic consultant with assistance from able job of preparing a case in the short time you will have after the rate increase is first announced.

Be represented at the pre-hearing conference so that you and your experts will be qualified to receive all of the voluminous papers and documents submitted. Once involved, be prepared to support your experts in their

efforts to develop a factual record for the PUC commissioners.

One final rule may be in order. Do not attempt to seek special favor or treatment at the expense of other classes of users.

The only way a PUC can work effectively in the best interests of all users is to develop a rational approach to rate making against any class of user. Under such a system your interests are fully protected.

D. Edwin Winslow of Bethesda, Md., is a former senior economist with the FCC and CAB. He presently acts as a consultant to carriers, industry, retailers and others before regulatory agencies.

IBM Data Software Keyed to Applications

By Richard L. Devaney
Special to Computerworld

The principal IBM programs and program products that support System/360 and System/370 in a data communications based environment are:

• **Bitam** (Basic Telecommunications Access Method), **Qdam** (Queued Telecommunications Access Method), **Tcam** (Telecommunications Access Method), **Cics** (Customer Information Control System), **IMS** (Information Management System), and **GIS** (Generalized Information System).

The capabilities of these packages can be viewed in terms of the data communications applications they support:

• **Message Switching and Data Collection.** Messages are received from remote terminals and generally do not access the central data base or require extensive processing in message switching. The messages usually consist of text-type information and are routed to other remote terminals by the central processor. For data collection, the data is stored for later processing.

• **Remote Batch Processing.** Jobs received from remote stations are routed and assembled for central processing.

• **Simple Inquiry.** A user at a remote terminal requests a specific item of information from the data base. It is assumed that the desired data record is known, and only a small amount of keyed input is needed to locate the item in the central file.

• **Browsing Inquiry.** Here the terminal operator does not have a complete key to the desired data, and does not know in which record the answer is stored. The central data base must be searched and portions of it selectively displayed until the requested information is located.

• **Data Entry and Update.** This is the direct entry of data from remote terminals. It is characterized by more extensive editing and screening than is required for *data collection*. When data entry is coupled with update, it is a more complex application, since the data base must be accessed and read, its contents changed, and replaced. Some type of "data management" is generally necessary.

Because messages arrive at the computer at random and require varying terminal speeds but are subsequently processed at computer speeds, telecommunications programming is divided into message control and message processing.

The message control program defines the telecommunications environment, establishes the details of line control, and governs the handling and routing of messages between computer and remote terminals.

It includes code translation, error checking, editing and queuing. The contents of the messages are handled by message processing (application) programs.

Data collection, message switching and similar applications, which may not require processing of the message contents, are frequently included within the message control program. Data base inquiries, data entry and updating, in contrast, require separate message processing programs.

Bitam is the do-it-yourself kit of the available IBM methods. Essentially untroubled, **Bitam** provides for sending and receiving of messages and for polling and addressing terminals. Using **Bitam's** facilities, an assembly language programmer must write his own message control program for establishing Read-Write level communications between the terminals and the CPU. The user must also supply the processing programs for his applications.

Qdam provides for the queuing of messages on disk to compensate for the random arrival rates of messages. A high-level macro language permits the quick construction of a complete message control program for handling message flow, message switching and data collection applications.

By taking advantage of this built-in message control program and **Qdam's** interface between it and his application programs, a user can implement a relatively large telecommunications network quickly and with less effort than with **Bitam**.

Tcam is the successor to **Qdam** for OS in System/360 or System/370. It provides a program that governs the flow of message traffic between the terminals (message switch-

ing), as well as the interface between the remote terminals and the user's application (message processing) programs.

Tcam also has facilities for operating in a time-sharing environment. Both **Tcam** and **Qdam** effectively shield the application programmer from the time-dependent and device characteristics of the telecommunications system.

Cics and **IMS** are supervisory data base/data communications systems that extend the capabilities of the basic access methods. They not only support terminal communication management and accounting, but also have facilities for advanced data base access and management.

The features of these subsystems tend to duplicate the programming and the content of physical data characteristics.

Cics and **IMS** essentially consist of a set of programs which interface with the user's terminal methods, the application program and the data base.

Cics emphasizes efficient utilization of core storage and rapid response time, even in very large terminal networks. These are the characteristics needed for inquiry-type applications, such as order entry, credit inquiry and update, inventory status, and customer service and information requests.

In contrast, **IMS** has greater data base management facilities, along with data base recovery and journaling. It, therefore, provides greater independence from the complexities of the physical data characteristics.

GIS is an executive system that responds in a few seconds to predefined and preprogrammed operational requests. **GIS** provides a high-level, English-ressembling language that allows a non-programmer to make spontaneous requests.

Richard L. Devaney is product administrator for telecommunications access methods with IBM's Data Processing Division.

Editor's Note

The Data Communications Supplement was compiled and edited by CW Technical News Editor Ronald B. Davis.

Formerly a technical writer with Honeywell and Bendix, he has been a consultant on computer-related communications problems.

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Isal Proposals Could Lead to Total Phone Repricing

By William H. Melody
Special to Computerworld
Frustration among data users with the rates and services being provided by the established carriers has been mounting for years.
Bell appears to have singled out data users for substantially in-

creased rates through special Information Systems Access Line (ISAL) tariffs. Most data users are in a quandary about this.

The problem of pricing data communications services relates back to the fundamental conflict between the unregulated, competitive computer industry and

the regulated, monopolistic, voice-oriented telecommunications industry.

The pricing policies of the established carriers, and the FCC's policies for regulating them are still founded upon the presumption that the carriers are monopoly suppliers of standardized

voice communications services. Whereas the FCC is now beginning to address these pricing problems, the state regulatory commissions have not yet been forced to look at the unique problems associated with data communications users.

Unless a particular user group

can bring enough pressure to bear on Bell management for special rate concessions, users are at the mercy of Bell's vague and flexible value of service judgments.

In determining rates for various classes of users, Bell's value of service models relate in part to usage characteristics of a "typical" user.

Users in large local exchange areas can call more people than users in smaller areas; therefore they bear higher rates. But the rate differentials are never justified by studies of usage or costs, and the range of usage and costs for different users within the same tariff classification may be substantial.

The supporting evidence is generally limited to the impressions of Bell management. It is evident that the service classification system creates substantial arbitrary rate discriminations.

Studies of usage volumes and their related costs might well show that the system is both unsupportable and obsolete. This is implied in Bell's attempt to classify data users in a separate rate category. Undoubtedly some large computer users do tie up lines and switching facilities for longer periods of time than a typical business user.

Under the traditional approach to pricing, Bell might establish a new service classification for computer users if and when it sees this usage as significantly different. But this can happen only if the computer users don't have enough negotiating power to prevent it.

Special Data Tariff

Data users have a much greater range of requirements than voice users. An attempt to fit data users into a special tariff classification that assumes fixed user requirements may simply replace old rate discriminations with new ones.

Under the traditional method for regulating communications services, Bell would seem to have every incentive not to create a special rate classification for data users. Increased costs could simply be passed on to the general telephone user.

If Bell System companies are proposing to create a special service classification for data users with substantially increased rates in the face of both vigorous objection from the computer community and the potential threat of competition from new specialized carriers, one's initial reaction is that it is probably justified.

The traditional methods of pricing voice communications services in monopoly markets are simply not applicable to the specialized demands of data users. Expanding usage will ultimately force the carriers to examine the usage and cost of all users in much greater detail. This won't occur until data users actively pursue the issue. It is now time that carrier practices and commission policies were adapted to the unique problems of pricing data communications services.

William Melody is Associate Professor of Communications and Economics at the University of Pennsylvania. He was previously an FCC staff member.

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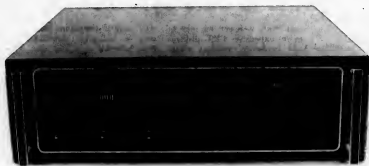
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And Costs Go Up Bell DAA Changes Can Cause Headaches

By Joseph W. Heimboeck
 Special to Computerworld

The continual re-design, improvement, replacement, and interface changes to Bell System Data Access Arrangements (DAAs) have kept the data communication users and independent manufacturers in a continual quandary.

A prime example of the DAA problem is the Western Electric Model F58012 Automatic Data Coupling Unit which became available as a preliminary unit in the Spring of 1969. As soon as the unit was announced, modem suppliers began to modify their systems to meet the interface requirements. Independent modem users configured their systems, terminals, and software to conform with the requirements of the Model F58012.

Since the unit was identified as a preliminary device, it seemed reasonable to assume that the final design would incorporate necessary operational improvements to overcome any deficiencies.

By mid-1970, independent equipment suppliers were providing 2400 bit/sec and 3600 bit/sec modems to operate with the F58012 over dial-up lines.

In August 1970, with only one month's notice from Bell, the Model F58012 was replaced by the Model 1001A Data Coupler for Automatic Terminals. The two were not interchangeable and no more F58012 units were to be manufactured. Also, many of the interface signals of the 1001A unit were completely different from the F58012. Instead of improvements the 1001A appeared to be completely re-designed and re-defined. Even the standard connector on the

interface cable had been replaced by a terminal strip connector.

To users and suppliers of independent modems, the 1001A

Data users who operate non-Bell data sets on the telephone network are required to install Data Access Arrangements. This article outlines some of the problems experienced by such users when the Bell System changed its DAA specifications.

was an unwelcome and costly surprise. One of the major differences was the lack of compatibility with established dial network control signals. The F58012 did provide this compatibility.

In fact, the F58012 was completely compatible with the total network scheme of AT&T, the Bell operating companies, and the independent telephone companies throughout the U.S. The 1001A, on the other hand, is incapable of operating with even Bell-supplied modem equipment. Some typical effects to users from the introduction of the Model 1001A follow:

● A northeastern pharmaceutical house had been operating a data communications system between New Jersey and Maryland since May 1970. The system had been successfully transferring data at 2400 bps

over dial-up lines using two 2400 bps modems supplied by an independent data set manufacturer, and two Model F58012 DAAs supplied by the phone company.

In January 1971, a suspected DAA malfunction at the Maryland site was investigated by the phone company and the user was informed that the F58012 may have to be replaced. The only replacement unit available was the new Model 1001A which was not compatible with the 2400 bps modem in operation.

Fortunately, in this instance, Bell was able to repair the old DAA and return it to operation.

● A Midwest terminal supplier incorporated a 3600 bps modem into his product. As the supplier began to install his equipment he realized that Bell had not delivered F58012 DAAs, and his 3600 bit/sec modems would not interface with the 1001A. They had been designed to interface with the F58012.

The modem and terminal suppliers combined in an around-the-clock effort to provide an appropriate interface package which allowed the terminal equipment to operate with the new 1001A adapter — at the additional cost of \$150 per modem.

● Another user found that his Model 1001A unit would no longer work with the accompanying common carrier de-

vices and his Touch-Tone dialing equipment — even though it had operated perfectly with his F58012 DAA.

The 1001A operates with the rotary or inquest dialing equipment which uses much more computer processing time than Touch-Tone equipment. Here again, the user was forced to use costly interface logic in order to use his Touch-Tone equipment with the 1001A data coupler.

In order to avoid the interface problem, International Communications Corp. designed the ICC Model DAA-1001A Adapter as additional equipment needed to make the new Bell 1001A data coupler "modem compatible" with standard ICC modems operating at 2000 bit/sec, 2400 bit/sec, and 3600 bit/sec. These same data sets previously interfaced with the preliminary Bell F58012 data access arrangement without an adapter.

These are only a few of hundreds of similar situations which have plagued the users of independent modems since the release of the Model 1001A data coupler. This trend of changing or modifying interface equipment or signal requirements appears to be a means of controlling the competition rather than providing adequate protection to the switched telephone network.

Joseph W. Heimboeck is Manager, Customer Relations for International Communications Corp.

User Called Uninformed About Benefits Of Voice Response in Data Systems

By Joel Naive

Special to Computerworld

Computer audio response systems have a lot going for them. They offer simplicity and economy. The spoken word is fast and to the point. And the Touch-Tone telephone is the simplest, most economical remote terminal of all.

Yet a major electronics publication recently ran an article entitled "Voice Response — in its infancy," and the majority of the facts presented are quite valid. So what are the reasons for this slow growth of a potentially explosive form of data communications?

According to a number of industry experts, including spokesmen from IBM, AT&T and Arthur D. Little, the slow growth of audio response can be summed up as follows:

● No supplier has provided a complete system from remote terminal to the input of the audio response.

● Users are not aware of the financial savings and potential of audio response.

● There has not been sufficient applications development.

● Audio response equipment has been limited to units with large vocabularies and few simple channels or vice versa — but not both.

● Users don't realize that a total information retrieval system can be centered around large numbers of low-cost audio response units used in conjunc-

tion with a few number of more expensive CRT displays and hard-copy printers where more extensive information or printout is required.

Up to now, these points have been quite valid. For example, an end-user wishing to lease or purchase an audio response system would have to deal with a number of vendors.

User Now Sophisticated

The computer-user of the '70s, however, has become far more sophisticated than in the past. Since the advent of unbundling, the end-user has learned that in many instances, independent peripheral and systems manufacturers offer more performance at a lower cost — yet still provide the necessary service.

A report issued by a leading computer research organization shows that about 1% of the 1,500 DP installations surveyed are using audio response. The survey also points out that this will increase to over 6% in the near future.

System Operation

A typical audio response system is made up of four basic components: the terminal, the communications equipment, the audio response unit and the computer.

Touch-Tone data is generated by the user on an ordinary Touch-Tone telephone or on a special Touch-Tone terminal. This data is sent to the computer

over regular telephone lines or over a dedicated communications network.

The communications equipment converts the tone-coded data into digital form and forwards it to the computer for processing. The computer returns the answer in digital form to the audio response unit where it is converted into a spoken message by automatically assemblage words, numbers, letters and phrases which have been pre-recorded on an audio drum.

The verbal response from the computer can acknowledge receipt of input data, answer inquiries and provide instructions to the user.

Joel Naive is technical director for Wavetek Data Communications, Chula Vista, Calif.

Data Changes Under

Network Improvements

(Continued from Page 5/1)

Then there is the question of equipment. Are CRTs really a good substitute for the old reliable teletypewriter or should it be considered only for special applications? And what about voice response?

The supplement considers some of the many options that are available to data users. Since data communications is such a rapidly changing area of the computer scene, the attempt here is to focus on selected areas and perhaps offer some different ideas.

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CRTs Have Advantages Over TTYs in Data Nets

By Richard Russell

Special to Computerworld
CRT terminals have many advantages over impact printers such as teletypewriters in data networks, especially for interactive applications. Until recently, however, they have also had a disadvantage — their lack of convenient hard copy.

Within the price range for operator-oriented, interactive terminals (under \$10,000), CRT's can receive and transmit data much faster than impact printers. They operate at speeds of 120, 240, 480, or 960 char/sec compared to 10, 15 or 60 char/sec for typical interactive, operator-oriented, impact printer terminals.

The higher speed of the CRT's can often reduce communication costs by the use of fewer, but more efficiently loaded, higher speed data lines. The higher speed of the CRT's can usually reduce operator manhours involved in interactive jobs by reducing the wait time for receipt of data. CRT's can thus decrease the number of terminals and operators necessary to handle a given volume of interactive transactions.

CRT's being electronic rather than electromechanical are also quieter and more reliable than impact printer type interactive terminals. These two features can also boost operator efficiency.

While some non-impact printer types of interactive terminals (such as the thermal, electrostatic, and inkjet) approach the lower limits of CRT speeds of operation (120 char/sec), both impact and non-impact printers lack one of the most important features of CRT's.

They are not as efficient at handling data entry, data change and data addition. On a CRT the operator can correct erroneous keystrokes by backspacing and typing over.

The operator can delete or move words or lines of information easily. Blanking characters or different type styles can draw the operator's attention to missing data that needs to be filled in. Finally, CRT's, unlike printers of any type, do not burden the operator with reams of unwanted hard copy.

With all those advantages CRT's have one significant disadvantage compared to printer type terminals. They do not offer hard copy, even when it is useful or even necessary.

The early attempts to remedy this defect of CRT's used impact printers either coupled with the CRT or shared by several units. However, these printers, in the 10 to 60 char/sec speed range, do not match the operating speed of the CRT's. They, therefore, introduce inefficiencies. By forcing operators to wait for hard copy, they can cost operator manhours and increase the number of CRT's necessary to handle a given workload. CRT's with integral hard copy match the operating speed of CRT's and yet are within the price range justifiable for operator-oriented interactive terminals.

Some CRT terminals can produce hard copy of any display in just 2 seconds. This speed is equivalent to a 500-character per second printer if a 1,000-character display is being copied. Furthermore, the copy process ties up the CRT buffer and display for less than 1/2 second.

CRT's have thus overcome the major disadvantage which they had relative to impact printers — their inability to produce hard copy at CRT speeds of operation within the price range justifiable for an operator-oriented interactive terminal.

Richard Russell is vice-president for Marketing with Photophys Inc., Mountain View, Calif.

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Service Finds Scholarship Aid

NEW YORK—Students needing a scholarship to go to college may find a source of funds through a service from Computer Search Inc. (CSI). Established about six months ago, and available from 40 banks around the country, the CSI scholarship search program is a prospective college student's obtain grants, loans, and other tuition assistance.

A data base said to contain 150,000 sources of aid available from 14,000 organizations including universities, foundations, corporations, and bank trusts is

matched with the qualifications of each applicant.

For a "processing fee" of \$20 a student receives at least 10 currently available aid sources for

Education

which he qualifies. If he receives less than 10, CSI said it offers a full refund.

To use the service, a student obtains an application form from a participating bank or directly from CSI. In addition to requiring scholastic information,

the form asks for a financial statement.

A profile of the student's qualifications is then matched by CSI with the scholarship data bank which is stored in the firm's 360/40.

The data base is updated regularly to keep tabs on changing scholarship requirements, according to David North of CSI. A recent survey of 100 applicants showed that about 20% had received financial assistance, North said.

CSI is at 120 East 56 St., 10022.

Attendance System Spots Absent Pupils

SACRAMENTO, Calif.—Slipping into class late while the instructor is calling the roll may soon be very difficult if the experimental Automated Attendance Accounting System (AAAS) proves successful.

Currently being field tested at the John F. Kennedy High School here, AAAS handles 76 classrooms and 1,600 students. Sponsored by state and federal funds, the AAAS system was developed by the Jet Propulsion Laboratory (JPL) and Informatics, Inc., to reduce high school absentee rates which at some schools are said to be as high as 25%.

With the AAAS, a teacher uses a special keyboard to enter data on absent students at the beginning of each period. This data is then transmitted to a special dedicated minicomputer which records the four-digit student ID numbers onto a magnetic drum. Within minutes after receipt of absentee data a report is returned to the school by teletype

writer.

In addition to saving teachers an estimated 40 minutes each day in time-consuming rollcalls and written reports, the AAAS will help keep track of students who report early in the morning

and then cut later classes.

Although it may have widespread adaptability to other school systems, the AAAS uses special equipment not yet commercially available.

University Accepts HHS Credits Toward Degree Program Completion

LOS ANGELES—Graduates of an industry computer school can now receive advanced standing toward a bachelor's degree at Pepperdine University School of Business.

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Seven Cities Involved

Consumer Complaints Collated

By a CW Staff Writer
WASHINGTON, D.C. - Consumer complaints from seven cities are being sorted by computer to enable various organizations to concentrate on the most serious and prevalent frauds and to prevent duplication of effort.

The project is being run by the Federal Trade Commission.

In each of the cities, the various consumer protection agencies have formed a consumer coordinating committee. Complaints to all of the agencies are pooled and assigned to the most appropriate agency. The complaints are also put on cards and sent to the General Service Administration for keypunching and processing.

Once a month, each city gets a printout listing all complaints in four ways: by merchant alphabetically, by merchant in order of number of complaints, by type of complaint, and by type of complaint within Zip code areas.

The listing is carried for up to one year, and also indicates which agency is acting on the complaint and what action, if any, has been taken.

Periodically, the FTC receives a compilation.

The listings permit the local consumer coordinating committees to find out which kinds of complaints are most common, and what merchants are causing the most trouble. This information has two uses: it permits law-enforcement power to be brought to bear against the most common problems and the most serious violators, and it permits consumer education groups to concentrate on the type of fraud most common at a particular time.

As an example of the latter, Alan Mann of the FTC noted that a model cities group could use the Zip code list to find out which complaints were most

common in the ghetto, and then attempt to educate consumers there.

The system has been in use in some of the cities for almost a year. In Los Angeles, for example, auto repairs turned out to be the biggest source of consumer complaints. Investigations were begun, and a number of companies were indicted.

Checkless, Cashless Society Idea Scheduled for Six-Month Test

UPPER ARLINGTON, Ohio - For six months, beginning Oct. 11, residents of this suburb will be subjected to a test of the checkless, cashless society.

The sponsors, the City National Bank and Trust Co. of Columbus, Ohio, and National BankAmericard, Inc., expect to learn about both the problems of implementing such systems and the reactions of consumers and merchants.

The test program is designed to determine the following:

- The requirements in terms of expense, educational information, and time to alter the paying habits of shoppers.

- The steps needed to make a purchasing system based on an electronic transfer of data convenient for customers and merchants.

- The requirements to streamline, speed, and protect sales and collections.

- The physical and operational problems to be expected in converting from a cash-check oriented purchasing system to an electronic data transfer system.

- The probable economics of the eventual system - and the steps to reach it - for the banking and computer industries and for merchants and their customers.

City National and NBI officials believe that information gener-

ated by the Upper Arlington test will contribute significantly to the development of a future system of payments.

The test will use IBM point-of-sale terminals and a computer program developed by Arthur S. Kranzley Co., Cherry Hill, N.J. The terminals will be installed adjacent to cash registers in stores participating in the test program.

Residents will use a different BankAmericard during the test. The card looks the same on the front, but on the back is a strip of magnetic tape, which conforms to specifications recently suggested by the American Bankers Association.

Here is how the system will work:

At the time of purchase, the merchant will use a telephone at the check-out station to dial the bank's computer. The merchant then will place the customer's credit card in the terminal and the key in the dollar amount of the sale.

The computer, by voice response, will confirm the amount of the sale and authorize the sale.

At the time the customer uses his card, the purchase is debited to his account and the merchant receives instant credit for the sale.

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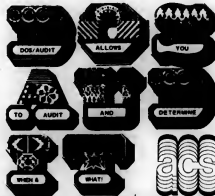
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ACS announces a new software package for IBM S/360 QDS which provides the user with control over his Core Image, Relocatable, & Source Statement Libraries. This is called DOS/AUDIT and provides:

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July 28, 1971

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Random Notes

IBM Charges for Hardware Change in 7070 Emulation

WHITE PLAINS, N.Y. — IBM sources have confirmed that although the software for OS 7070/7074 emulation on the 370/155 is available at no cost [CW, July 14], the hardware feature needed to implement the emulation carries a monthly rental of \$900, with a purchase price of \$43,200. The change is field-installable, the company said.

Symposium Offers \$1,000 Grant For Computer Simulation Study
TAMPA, Fla. — A grant of \$1,000 is available for research on tools, techniques and new applications of digital computer simulation. Originally, potential contribution to the art and science of simulation will be among the factors considered, according to the Annual Simulation Symposium, which will make the award.

Applications are being handled by Walter R. Benson, Midwest Research Institute, 425 Volker Blvd., Kansas City, Mo., 66110.

CDC Fortran IV Math Library

Includes 1,800-Page Handbook
MINNEAPOLIS, Minn. — An eight-volume Math Science Library of software routines, designed for users of CDC 6000 and 7600 systems, of the Fortran 70 family, is available from CDC. The routines are written in Fortran IV and cover subjects from programmed arithmetic to nonlinear equation solvers.

The library also contains an 1,800-page handbook as a reference to the full library. The handbook can be used for an initial \$450 license fee and \$450/mo royalty, CDC said.

'Inquire' Improved by Infodata
ARLINGTON, Va. — An enhanced version of the Inquire generalized information management system is available from Infodata Systems Inc. (1901 N. Fort Meyer Drive, 22209). The Release 3 Version 1 provides for the handling of "repeated fields," records in which a field or group of fields within an item or record may have multiple values. The newest Inquire also provides accounting and usage statistics for each query or set of queries processed. Password security is also built into this version of the \$28,500 system.

'Expert' Gains New Option

ANAHEIM, Calif. — Users may be able to get significantly shorter plots through the Expert network graphics system, with the Non-Time-Phased Layout (NTPL) option, from Systonics Inc. (600 N. Euclid St., 92801). NTPL is said to be useful to those who prefer a logical layout only during the initial stages of building a project, as well as to those who do not need time phasing in their plots. Once a network is stabilized, other Expert features can produce a time phased network plot, Systonics said.

Tripple Now Marketing 'Series'

SAN FRANCISCO — The Series data management system which can be used to generate Cobol programs is now available from Tripple Systems Inc., 120 Montgomery St., 94104, through an agreement with the original Series developer, Information Systems Management Inc.

Inexpensive System

'Super/Pay' Handles Complex Payrolls

By Don Levitt
CW Staff Writer

LOS ANGELES — OS and larger DOS/360 users can acquire Super/Pay, a payroll and personnel management system that provides processing by corporate division for less than \$1,000 from California Data and Financial.

In addition to payroll checks and journals, Super/Pay processes employee rosters, deduction registers, and tax reports and forms for individual employees. Labor distribution records, credit union deduction records and sick and vacation reports are also generated, Cal-Data said. Super/Pay is able to handle 36 types of earnings and 32 types of voluntary deductions, the company said. Each employee's record can include five state or local taxes and separate handling for U.S. and Canadian federal taxes.

To calculate routines for the states and other more local authorities that require income tax deductions are built into the package.

The Cal-Data package is built around an employee master file but includes two control files to allow the user to adapt the program to his requirements.

The profile permits the user to arrange deduction register headings and the data

to be printed, and to enter the earnings descriptions for check writing and related registers. On a division basis, it provides a means of specifying deduction priorities.

The description file is used for maintenance of the employee master records in terms of field structure and organization. The user's own descriptions for fields, deductions and earnings categories can be used through this file, the company said.

The user can modify the normal processing at execution time through the inclusion of parameter control cards. Maintenance transactions and employee

time input can be on either card or tape.

Each employee master record is normally 3,700 bytes long and the system operates in an 80K partition under OS/360. By reducing the file sizes, however, the application may be used in a 65K DOS oriented CPU.

The system requires five tape drives and control 2314 disk space to handle control files and sort work areas," as well as a card reader and printer.

Super/Pay costs \$950 and is available from Cal-Data at 3440 Wilshire Blvd., 90005.

'Macro/Snap' Eases Programming For Cobol-D, ANS Cobol Users

WINSTON-SALEM, N.C. — Users who are continuing to use IBM's Cobol-D gain the use of the DOS Source Statement Library and a macro capability comparable to that available under Assembler Language, with the Macro/Snap precompiler from Mark III Systems III.

The basic Simplified Notation for Application Programming (Snap) package

provides the Cobol programmer a means of generating source programs, including a cross-referenced listing and Job Control (JCL) cards, without the extensive coding normally required.

Users oriented towards IBM's ANS Cobol can run the Macro/Snap Cobol-D output through the appropriate Language Conversion Program, available without cost from IBM. Output from the LCP will be in ANS Cobol form and ready for compilation, the company said.

Macro/Snap is said to eliminate as much as 90% of the coding required for some Cobol programs. The package contains many ready-to-use macros, as well as allowing the user to code his own.

One of the macros supplied by Mark III is designed for test data generation so that realistic records based on state file parameters are available for use in debugging new systems. Another macro supplied by the company is a report program generator.

Macro/Snap operates in less than 24K bytes of core, and requires no special peripherals beyond those of the user's Source Statement Library. The package may be purchased for \$2,750 or rented for \$90/mo from Mark III Systems at 1036 Northwest Blvd., 27104.

'AutoPL/1' Upgrades 1400 Code

INDIANAPOLIS, Ind. — IBM 360 users still running 1400 programs in compatibility or emulation mode can upgrade to native code with the AutoPL/1 package for translating Autocoder to PL/1, available from Indiana Gas Co.

Translation with AutoPL/1, as with most translators, is not complete but it is in the 80% range, depending on the instruction mix, according to the gas company. Translation is normally from Autocoder source code to PL/1 listing.

Autocoder instruction mixes that tend to be the most difficult for translators include printer editing routines, multiplication and/or division, and conditional branching.

Once the user has modified his Auto-

coder to maximize the translation a PL/1 source deck option can be invoked.

AutoPL/1 is said to be extremely fast. It will process a 2,000 card Autocoder program in about 13 minutes on a 360/30, according to the gas company.

AutoPL/1 was written in Assembler Language and will run in 32K bytes. Additional core allows the expansion of internal tables used for constant word marks, the Store B Register routine, branch word marks and explicit addressing, and would improve the effectiveness of the translation process.

The translator is available for \$2,000 from Indiana Gas at 1630 North Meridian Street, 46202.

Utilities Drive Two 1403s From Single DOS Partition

SPRINGFIELD, Ill. — Separate reports can be produced from tape or disk files on two printers driven from the same DOS/360 partition, with the Extended-Tape-to-Print (E-T-P) and Extended-Disk-to-Print (E-D-P) utilities packages from Franklin Data Services Corp.

The Franklin routines provide both forward and backward file repositioning for restart and selective printing, in addition to the two printer option, as features that are not available through the IBM utilities.

These utilities are written in BAL for use under DOS/360. Each will run in a 10K partition driving one printer, but require 18K bytes if the two printer option is selected. The routines cost \$500 each, and the option for driving two printers costs an additional \$250. Installation is so simple it is handled through the mail, the company said.

Franklin Data Services Inc. is at Franklin Square, 62705.

'Billboard' Displays Job Names

PITTSBURGH, Pa. — Users who feel they lose track of jobs in the normal stream of control printouts can solve this problem in a big way, for only \$300, with the Billboard utility routine from Venture Systems Associates.

Billboard is a routine that clearly identifies each job by enhancing the standard eight-character job name, based in the job control log. It expands the job name into two-inch block letters which are printed on a dedicated page. Billboard marks End-of-job in the same way.

Venture Systems Associates can be reached through P.O. Box 13142, 15243.

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Smaller Firms Aided

RCA Supports Brokerage Back Offices

MARLBORO, Mass. — Small and medium-sized brokerage firms can run many of their accounting functions on a 65K Spectra 70 or RCA Series CPU, with the RCA Brokerage Back Office System One, to be distributed without cost to users by RCA.

The system is designed for brokerage firms that process no more than 3,000 stock transactions a day, the company said.

Made up of three major subsystems — Purchase and Sale, Stock Record, and Bookkeeping — the package can be run using either DOS or TDOS operating systems.

BAL Macros Use Fortran Format

HONOLULU, Hawaii — Users can gain the full facilities of the Fortran formatted READ and WRITE statement of any complexity, in a DOS or OS Assembler, through the use of the FREAD and FWRITE macros available from Software Associates (SA).

The macro statements are said to be almost identical to the Fortran ones. Any format specification can be used, SA said.

Character or arithmetic strings to be brought in or put out in A or Z format can be of any length up to line size. Arrays of such strings or variable substrings of such strings can also be brought in or put out, the company added.

The FREAD and FWRITE macros may be catalogued in the user's library in the normal way. No special control cards are needed. Parameters available within the macro Call are all that are needed to Format the read or write to any given situation.

The macros cost \$500 and can be purchased from Software Associates at 941 Nolo St., 96816.

Under the Purchase and Sale subsystem, name-and-address and security master files are both created and maintained. In addition, this subsystem computes daily trades and processes customer confirmations as well as broker comparisons.

The Stock Record subsystem creates and updates a stock record master file which is used to produce daily summaries and weekly stock record listings, and generates an option report file. Under the Bookkeeping subsystem, a journal is prepared and a balance file is created and maintained. In addition, this subsystem generates a trial balance and a transfer posting report. Also generated by this subsystem is a monthly statement file which is

used to produce customer and general ledger statements.

In addition to a 65K CPU, the minimum computer configuration for the effective implementation of the brokerage package includes six tapes, two disks, a printer, a card reader and a card punch.

The brokerage package is the third major software system announced by RCA for users in specialized industries in the past few months. An on-line Manufacturing Information Control System was shown at the SJCC in May. A centralized Customer Information File package for banks was introduced in April.

Documentation for the brokerage package will be available in September, RCA said.

'CAL' Useful, But Huge

WILMINGTON, Mass. — IBM OS users can handle Fortran compilations, BAL assemblies and link-edit functions in one step, with the Compile, Assembly, Link-Edit (CAL) system software from Avco Computer Services. The only real catch is that CAL requires 350K of core under OS in order to operate.

A mixed stream of Fortran, and BAL source decks and BAL object or Fortran binary-coded decks can run under CAL's control. Another level of flexibility permits the selection of either the G or H Fortran IV compiler, and the compiler option may be changed between decks.

Linkage editor control cards may be included in the input stream to define load modules or to indicate members of a library.

CAL also includes a series of utility routines. One of these provides source code translation from BCD to EBCDIC coding, with automatic sequencing and labeling. Otherwise decks with a specified label may be deleted, as can duplicate labels in the stream.

Multiple input streams are possible, as are multiple outputs. The system also prints the entire input stream, if requested. CAL is priced in the \$2,000 range, Avco said, and requires 4,800 tracks of disk space beyond the normal space needed for compilations and assemblies.

Avco Computer Services is at 201 Lowell Street, 01887.



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communications

Bell Tariff Briefing Fails To Resolve User Questions

By a CW Staff Writer
WASHINGTON, D.C. — Apparently the more AT&T modifies its proposed interconnection requirements for data users of voice grade private lines, the more things stay the same.

After issuing detailed "interconnection notes" for the FCC and affected users, AT&T representatives recently held a public briefing at the request of the commission to clarify the "intent, meaning and application" of the proposed modifications.

Attended by about 100 persons, the Bell briefing failed to add much technical information. In addition to users seeking additional details on the private line interconnection plans, representatives of Western Union, General Telephone, and other independent carriers told Bell that they would not be able to meet the August 15 date when the required service terminal modifi-

cations would have to be installed.

Although Bell has said that the proposed changes would be installed at no cost some users expressed concern that AT&T would charge for the interconnection in the future.

In response to a question concerning the effect of the proposed changes on multiplexed lines by non-Bell data users, an AT&T representative said these types of installations would not be adversely affected.

AT&T spokesmen at the session said that Bell plans to issue more details of its proposed modifications to Tariff 260 by the end of July.

The proposed "protective measures" which AT&T has said will be applied to the service terminal of most non-Bell private line data users will go into effect on August 15 unless it is suspended by the commission.

By Ronald A. Frank
CW Technical News Center
WASHINGTON, D.C. — Having spent seven years fighting for FCC approval, the specialized common carriers may now have a new fight brewing on the state level.

The recent FCC ruling which authorized, for the first time, competition between the established carriers such as AT&T and Western Union, and the specialized carriers including Microwave Communications Inc. (MCI) and Data Transmission Co. (Datan) covered only interstate operations. The specialized carriers, although greatly favored by the FCC ruling, will now need intrastate authorizations from state regulatory commissions.

It is these commissions, represented by the National Association of Regulatory Utility Commissioners (NARUC), that have petitioned the FCC to reconsider its recent free competition ruling.

In its petition NARUC said that competition will benefit only a small number of affluent business users. NARUC further cited the Communications Act of 1934, generally regarded as the law governing FCC operations,

as stating that new common carriers can be authorized only when existing carriers are unable to provide adequate service.

The FCC probably will not reconsider its decision and the question may well go into the federal courts but the net effect could spell more delay for the specialized carriers.

MCI which expects to begin operations of its Chicago to St. Louis link soon, will apparently bypass the need for state tariffs at first by using local loops provided by the phone company. Under this arrangement the new carrier will be restricted to providing service only to interstate subscribers.

But both MCI and Datan have proposed methods to provide their own local loops to subscribers. In addition, each intends to serve users within individual states. And both types of intrastate service will require

authorizations from the various state regulatory agencies.

Asked whether the NARUC petition to the FCC might indicate problems for the specialized carrier at the state level, a NARUC spokesman told CW that the new carriers would have to prove that existing carrier services were not adequately meeting the needs of users on the local level.

A spokesman for Datan said the carrier plans to begin requesting intrastate approvals as soon as its gets FCC approval. Datan will need to get tariff authorizations from regulatory commissions in 26 states, the spokesman said.

The NARUC petition is raising questions that have already been argued in detail before the FCC, according to an MCI spokesman. MCI will need tariff authorizations in about 41 states when the nationwide network becomes operational, he said.

Data Briefs

Bell Says DAAs Reach 4,500

WASHINGTON, D.C. — In 27 months, through March of this year, Bell System companies installed just over 20,000 units to interconnect user-provided equipment with the carrier network. Of these, 2,757 were manual data access arrangements and another 1,800 were automatic DAAs, AT&T told the FCC recently.

Trendata Terminals Replace IBM 2740, 2741

SUNNYVALE, Calif. — Data users currently using IBM 2740 or 2741 terminals can get more flexibility at less cost with one of three communications stations developed to replace the IBM units by Trendata Computer Systems Corp., 595 N. Pastoria, 94806.

The Trendata 1000 is plug-to-plug match for the IBM 2741, but includes as standard features that are extra cost with IBM. The 1500 provides a Phillips-type magnetic tape cassette and extended editing capabilities, along with the 2741 features. The 2000 can replace either the 2740 or the 2741, under manual switch option. It also has provision for four station addresses to make it portable.

Prices on the Trendata units provide a 10% to 30% savings compared to IBM lease costs, the company said.

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Bits & Pieces

Telex Introduces Discounts Of 6%, 12% on Sales

TULSA, Okla. — Wrapping up the responses of independent peripheral makers to IBM's June 1 price cut, Telex has introduced two purchase plans for its tape and printer subsystems, giving purchasers discounts of 12% and 6%.

The outright purchase plan gives Telex customers who pay cash within 60 days of purchase a 12% discount from the list prices. A 36-month installment purchase plan has no interest or carrying charges, and offers a 6% discount from published prices. Under both plans, rental customers who purchase their equipment within the first six months after the rental start date can apply 100% of the first 90 days' rent to the purchase. This would be on top of the 12% discount a user would get if he paid within 60 days.

Laseasac to Offer 3336s; IBM Will Only Sell the Disks

CLEVELAND — Laseasac Corp. will be leasing 3336 disk packs for IBM's soon-to-be-delivered 3330 disk file on either a full payout or short-term lease. IBM plans to sell the disks for \$1,000 each. IBM's first deliveries are scheduled for August. Laseasac is at 23945 Mercantile Road, #4122.

Paper Tape Winder Weighs 10 oz
HANOVER, N.H. — A handheld electrically operated paper tape winder from Logic Associates, Inc. weighs less than 10 oz and can wind a 4 in. roll of paper tape in 5 sec. The unit features a specially designed hub that is said not to crimp tape. The device is priced at \$42.50 and is available for immediate delivery from 3 Lebanon St., 03755.

Copier Runs on Display Signal
BEAVERTON, Ore. — Tektronix's 4602 video hard copy unit makes facsimiles of static television signals with either accurate gray scale representation, or high contrast alphanumeric and graphic display reproduction.

The 4602 is completely self-contained, and needs only a power source and a data input. Contrast and density can be adjusted by the operator. The unit provides 8-1/2 by 11 in. dry copies.

It can operate from refreshed CRT displays using the acquisition connector to the video signal common on these units, Tektronix said.

The 4602 costs \$3,750, and is available from Box 500, 97006.

HP Graphic Display

HP CRTs Use Electrostatics.

PALO ALTO, Calif. — The electrostatic deflection system of Hewlett-Packard's 1310A CRT can reposition and settle the beam from one corner of the 19 in. display to the diagonally opposite corner in less than 1 μ sec, making it possible to write more characters on the display without resorting to slower, flicker-prone refresh rates, according to the company.

By contrast, a typical magnetic deflection system requires about 20 μ sec to do the same job, HP said.

Magnetic deflection has traditionally been used because it allows a shorter tube, achieves a small spot size easily, and does not require a high-voltage source.

HP uses a dome-shaped, fine mesh screen, placed in the electron beam beyond the deflection electrodes, to shape the electrostatic fields.

The screen magnifies the deflection given the beam by the electrodes making it possible to get wide deflections in a short tube using fairly low voltages. It also converges the beam at the phosphor surface to obtain a 0.02 in. spot size.

Complete with deflection and blanking amplifiers, the unit weighs less than 50 lb and consumes less than 100 W, HP said.

The 1310 costs \$3,000, while a 14-in. unit, the 1311A, is priced at \$2,850. Deliveries are scheduled to begin in August.

Hewlett-Packard is at 1601 California Ave., 94304.

Unit Reels In Tape

HIGHLAND PARK, Ill. — Data Specialist's TM/33 automatic paper tape handling system eliminates tape damage and increases operator efficiency, the company said. The \$99 unit feeds and collects tape on spools mounted to Model 33 Teletypes. The firm is at 1548 Old Skokie Road, 60035, and the units can be delivered immediately.

Trio of Remote Terminals Make Debut at Honeywell

By Michael Merritt
CW Staff Writer

WALTHAM, Mass. — Honeywell has announced two programmable remote batch terminals, and a smarter terminal it bills as a free-standing computer with communications capabilities.

The two terminal systems, called Model 5 and Model 10 in the 100 series, can be operated on-line to larger host computers, either Honeywell's or other manufacturers'.

Standard configuration for the terminals includes a central processor, card reader, line printer, and single-line communications controller. Options are faster card reader, faster printer, card punch, magnetic tape drives, disk drives, and communications adapters for a variety of terminal-to-central computer connections.

Model 5 Cheapest — No Mass Storage

The cheaper Model 5 is available in standard and high speed versions. The CPU on the standard has 4K (bytes) of main memory and a cycle time of 6.5 μ sec per byte, while the faster has an 8K memory and faster card reader and printer. In addition, the communications controller on the standard model is designed for 2- to 2.4 kbit/sec, while the faster unit is designed for a 4.8 kbit/sec rate.

Either model can accept an additional 4K of memory. The standard model leases for \$936/mo on a one-year lease, and can be purchased for \$37,440. The high speed Model 5 leases for \$1,300, and sells for \$52,000.

The Model 10 systems, also available in

standard and high-speed configurations, are essentially the same as the Model 5, with the addition of 3 Mbytes of disk file storage.

This boosts the lease price on the standard version to \$2,005 a month and the purchase price to \$82,205. On the high-speed version the lease price is \$2,265 and the purchase price is \$92,865.

Programming languages available on the 5 include Logic Generation Language and an assembler. Model 10 terminals can handle Cobol and Fortran compilers and a disk operating system, while the 10 also accepts tape drives, which the 5 does not.

But Model 15 Is a Computer

The Model 15, "a small-scale business-oriented batch data processing system" that can also be used as the central system for Models 5 and 10, or a remote batch terminal for a larger computer, comes with 16K of main memory and a cycle time of 4 μ sec.

The minimum system has a 60 to 200 card/min card punch, and a 400 to 200 line/min reader, a 600 line/min printer, and two disk drives that hold 5.7 Mbytes.

The system is available only on three- or five-year leases, or on purchase. The basic system rents for \$3,056 a month on a three-year lease, and sells for \$132,585.

Model 15 memory can be expanded to 65K; disks can be loaded up to 61.4 Mbytes. The 15 can be equipped with magnetic tape drives, either 7- or 9-track.

There are a number of business-oriented applications packages available for the 10 and the 15.

IBM Gives System/7 Disk Drive

WHITE PLAINS, N.Y. — IBM has given the sensor-based System/7 disk capacity and a custom-designed console that can drive a CRT display.

The disk module, Model 5022, comes in four variations, with capacity for either 1.23- or 2.46 Mwords (16 bit), and average access time of either 126 msec or 269 msec. Data transfer rate for the disk system is 99,500 word/sec.

The small capacity units use one fixed disk, while the larger ones also have a removable disk cartridge.

Model 1, with both disks and a 269 average access time rents for \$390 a month or can be purchased for \$14,870; to improve the access time to 126 msec on the double disk unit, users will pay a total of \$455 a month or \$16,225.

Model 3, which has one disk and 269 msec average access time rents for \$300 a month, and sells for \$13,245, while the faster small disk gets for \$365 a month or \$14,600.

The disk "significantly enhances the storage capacity and flexibility of System/7," IBM said, and extends its range of applications. For example, a stand-alone disk-equipped 7 can compare test results with information stored on the disk file.

The custom console, available on special order, permits users to query and instruct the computer and display the status of a process. It consists of a control unit and several I/O devices, which may include a user-provided CRT, either color or monochrome.

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Infotron Port Selector Allows Twin CPUs in Tandem or Apart

PENNSAUKEN, N.J. — Users with dual CPUs available for time-sharing operations can operate with the units in tandem, or remove either CPU for maintenance or off-line use, with the solid-state Model 440M port selector, from Infotron Systems Inc.

The 440M is an extension of a line of port selectors previously developed by the company to enable many incoming data lines to contend for fewer number of ports on a single CPU. The 440M provides manual switch selection to either or both of two CPUs.

A typical port selector application according to Infotron might be a system with 56 dial-in data lines servicing terminals throughout the country, all of which are in contention for 32 ports on two New York based CPUs.

The 440M permits partitioning of lines and ports into four speed-groups, by manual strapping across the unit. The speed group "programming" or strapping establishes the first and last lines and channels in group and defines the groups in terms of 110, 135, 150 or 300 bit/sec speeds.

In its largest configuration, the 440M is said to be capable of handling up to 56 data lines and an equal number of ports. Price of the basic 440M is \$7,500, including a two-year warranty. In addition there is a charge of \$120/channel or \$480 for the standard 4-channel PC board for either line- or port-side. The speed-group control adapters are \$160 apiece for each speed.

Infotron Systems Corp. is at 7300 N. Crescent Blvd., 08110.



The Dataphone on the desk indicates that there's something new about the secretary's MCST — the ability to transmit to another Communicating MCST.

Mag Card Selectrics Get Communications To Other MCSTs, CPUs

FRANKLIN LAKES, N.J. — IBM's Mag Card Selectric Typewriter has been given a communications capability, turning it into a terminal and data input station, as well as a "word processor."

The Communicating MCST transmits over voice-grade lines at 150 words per minute. An original typewritten document is the output of a receiving Communicating MCST.

IBM said that the new model can be used as an input/output terminal for computers, as well, transmitting at a rate of 15 char/sec.

Purchase prices begin at \$10,575, and monthly rental at \$235. The communicating capability can be added to installed Mag Card typewriters for \$2,700 or \$60 a month.

CRT Capability Adds To Data Entry System

DALLAS — General Computer Systems has added a CRT terminal to the line of peripherals that can be used on its 2100 key-disk-tape system. Up to 64 of the terminals can be loaded on the system.

The CRTs come with 64-character keyboards laid out in typewriter and key-punch configurations. Auxiliary numeric clusters can be used in either keypunch or 10-key addition machine layouts.

The terminal has an e-key rollover feature which prevents information loss if more than one key is depressed at a time. The new terminal uses the echo process in which each keystroke transmits data to the computer, which retransmits it to the display, allowing error message display after edits by character, field, record, and batch.

The screen can display 16 lines of 32 characters, for a total of 512 characters. It has a 60-cycle refresh rate, and permits format control.

The data controller, a 2 juce, 16-bit mini, has up to 64K of core and 132 basic instructions.

Deliveries on the CRT terminal are scheduled to begin in August. Monthly rental on a 20 station system including data controller, software, disk, and tape, is about \$2,800. Individual CRTs lease for \$75/mo.

General Computer Systems is at Box 30452, 75230.

CBS Television Develops TV Ad Selling Systems

NEW YORK — An on-line computer system that facilitates selling TV advertising, and also provides billing and invoicing operations, has been announced by CBS Television.

Currently in use by several of the CBS-owned stations, the system has reportedly improved the flow of information between agencies and the stations. In originally announcing the "broadcast management information system," Miller said the system would help carry out a CBS commitment to "development of a comprehensive system aimed at eliminating paperwork for our clients."

Alan P. Sloan, vice-president of the division, told attendees at a recent meeting of the Advertising Data Processing Association that the system provides tight control of every "spot" ordered, from the time it is entered through the broadcast scheduling procedure, the actual broadcast, and finally to the invoice.

The system provides instantaneous access to demographics and ratings, plus data on sales availabilities, traffic, broadcast operations, technical and accounting functions, and the ability to use advanced mathematical techniques for management decision-making.

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CI Notes

Memorex, Tymshare Deal

PALO ALTO, Calif.—Tymshare's national sales organization will sell and lease Memorex terminals. Under the agreement, Tymshare will sell and lease Memorex terminals to users of Tymshare's time-sharing service. The Memorex terminal is capable of operating at speeds of 80 char/sec and will be upgraded in the future to even higher speeds, although Tymshare will initially offer speeds of 30 char/sec.

Barclays Burroughs Pact

LONDON—Barclays Bank Ltd., has announced that as a result of acceptance tests carried out by the bank and CAP Ltd., a British software company, on the Burroughs B6700 installed at the bank's Willenden Computer Centre, the bank has authorized delivery of the two additional large-scale B6700 systems which it has on order.

The value of B6700 large-scale and TC500 terminal computers for Barclays' nationwide banking automation program is approximately \$38 million.

GE in Japan T/S Move

BETHESDA, Md.—General Electric, in conjunction with Dentsu Advertising Ltd., Japan, last week announced expansion of its international computer time-sharing services to Asia. A new 1½-year agreement between the two firms provides for Dentsu to utilize the service from a GE developed computer system to be installed in Dentsu's Tokyo headquarters.

Under the terms of the agreement, GE will provide Dentsu with all system, operating and applications software, user documentation, as well as technical support and training assistance. Initial availability of Dentsu time-sharing is scheduled for late 1971.

Supershorts

"The market for outside software and services exceeded \$1.8 billion in 1970, will climb past \$3 billion by 1975, and reach \$5.6 billion by 1980," according to Frost & Sullivan Inc.

Owens-Illinois, Inc. will begin commercial pilot plant production of its Digivue electronic digital display/memory panel.

Bubbles, Oronic Technology

New Systems Competing With Semis

By a CW Staff Writer

SUNNYVALE, Calif.—Semiconductor memory manufacturers will have a boom in sales over the next few years but will face increasing competition from magnetic bubble memories and amorphous semiconductor memories by the end of the decade, according to a recent study.

The overall memory market will grow from 27.1 billion bits in 1970 to 69.5 billion bits in 1974, with a corresponding revenue growth from \$25.2 million to \$331.6 million in the open, noncompetitive

land Smith of Signetix Memory Systems here.

Revenue from this market will bring memory manufacturers \$813 million in 1970 and will grow to \$1.59 billion by the 1975 time period, Smith said.

Semiconductor memory makers supplied 684 billion bits in 1970, but their share of the market will jump by 1975 to 12.9 billion bits, with a corresponding revenue growth from \$25.2 million to \$331.6 million in the open, noncompetitive

market. The MOS memory market, according to Smith, will grow by 14 times between 1970 and 1975 from \$18.4 million to \$25.7 million. The bi-polar market will show an 11 time growth from \$6.8 million in 1970 to \$74.6 million in 1975.

During the same period, the IC RAM market will grow from \$4.1 million to \$54.6 million in value, while serial memories used to construct RAMs will grow from \$12 million in 1970 to \$150 million in 1975. The IC ROM market will increase from \$9.1 million in value in 1970 to around \$127 million in 1975.

The overall mainframe memory market will be valued at around \$500 million this year, and should grow to a \$2 billion market by 1975, Smith forecast. The market is made up of core and solid state memories with plated wire forecast to be displaced by 1975, Smith added.

For mainframes, the solid state market is forecast to grow from \$12 million in 1971 to \$70 million in 1975 with MOS accounting for \$8 million in 1971 and \$48 million in 1975.

The value of the memory in the computer system will also rise. Memory will account for 25% of the value of the computer in 1971, he said, but will rise to 37% of the overall system by 1975.

"Because semiconductor memories are 3-5 times faster than core and occupy 1/18th of the space, core displacement is inevitable," according to Smith. The timing is a function of displacement costs," he added.

Because MOS production is relatively efficient, the chips are easily packaged, and the systems require very low power, MOS is forecast to be the dominating technology by the late 1970s, Smith stated.

By that time, however, semiconductor memories will have competition from two technologies presently in the formative stages—magnetic domain bubble memories and amorphous semiconductor memory technology, Smith projected.

A working bubble memory looks to be from 3-5 years off from the production standpoint at the present, Smith said.

"The technology most likely to displace the conventional semiconductor memory," Smith added, however, "is the oronic cell."

The amorphous semiconductor "is producible by today's processes, it is cheap, it is capable of dense packaging, it interfaces with present semiconductor, and it uses a lot less power," Smith claimed.

IBM Punched Card Equipment Dominance Challenged By GAO

By Alan Drattell

CW Washington Bureau

WASHINGTON, D.C.—One of the steady revenue and profit producers for IBM—the huge amount of punched card equipment the firm rents to government agencies—is under attack.

And the attack is not coming from competitors, but from the central watchdog agency for government spending, the General Accounting Office.

Federal agencies are not taking advantage of "substantial" savings available from a current contract with five leasing companies for the rental of punched card equipment, GAO charged in a report submitted to Congress recently.

The GAO recommended that the General Services Administration, which negotiated the contract for the government, tighten its monitoring of punched card leasing actions by agencies.

The GSA, in turn, has agreed with GAO's findings and recommendations and has initiated various actions to insure competition in the area of punched card equipment.

The latest statistics available, GAO said, show that in fiscal 1970 the government was using 28,192 punched card units made by IBM, about 98% of all installed machines. Of that total only 2,600, or about 9%, were rented from leasing companies.

In the specific contract cited, for 2,444 units, the government could have realized annual savings of \$2.6 million if agencies had taken full advantage of the contract with third party leasing firms. As of last Dec. 31, less than 50% of the units had been ordered by agencies under the contract negotiated a year ago.

Many were reluctant to deal with the

leasing companies, fearing such things as "administrative burdens" and "increased costs," according to the GAO charges. The watchdog agency, however, said that these fears have proved unfounded.

GAO emphasized that it believes "substantial savings can be realized by obtaining competition in the rental of a large portion of the government's (punched card) equipment."

And it has suggested that GSA might consider competitive contracting on an installation basis as being a more effective alternative to the present arrangement.

IBM Realigns GSD Labs to Strengthen Process Position

BOCA RATON, Fla.—Emphasizing its commitment to the small computer and process control market, IBM has made its General Systems Division laboratory here the center for all development of sensor-based and small scientific computer systems.

Dedication of the lab to a single development mission is part of an overall realignment of the General Systems Division.

"The control laboratory and industrial process [is] one of the fastest growing markets for computers," according to C.B. Rogers, Jr., president of the division.

The realignment includes the formation of three new development organizations: Sensor-Based and Small Scientific Systems, Sensor-Based Applications and Custom Systems, and Marketing Requirements and Business Control.

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Analysis—Part II

Memorex Combines Fiber Optics, LEDs in COM Unit

By Mark Flomenhofs

Special to Computerworld

The use of light emitting diodes (LEDs) in the Memorex 1603 COM (computer output microfilm) system led to a great deal of interest in the technique within the computer and microfilm industries, even though the use of LED imaging was fairly well known in government display research.

Basically, the method employs an array of photodiodes to construct a character-forming matrix, 5 by 7 in the case of the Memorex 1603. Each diode of the array corresponds to a single element in a particular matrix, and the diode illuminates only when activated by a signal from the character generator of the system.

To visualize this process with respect to the 1603, one must add the concept of

fiber optic strands conducting light from the diodes to an assembly face, where the strands terminate in the 5 by 7 configuration. When a diode illuminates, the tips of the strands attached to it glow at the assembly face.

An interesting property of LEDs is their emission of either red or infrared light. Silver halide film is used for LED recorders as well as for CRT COMs, but it is extended to red and infrared light rather than to blue as is customary in CRT imaging.

One of the advantages of solid-state technology is the greater luminescence of diodes compared with CRTs. It is clear that film benefitting from a light source more intense than usual can be less sensitive and therefore less expensive than other film.

Unfortunately, the user of an LED COM

unit should not necessarily expect to realize this saving since the explosion of specialty cartridges throughout the microfilm industry usually ties the consumer to a single supplier.

The chief sources of LEDs at present are Monsanto and Hewlett-Packard Associates, but such major semiconductor manufacturers as Fairchild, Motorola, and Texas Instruments are known to be building a large capability.

The major advantages of LED imaging include:

- The LED assembly is inherently less expensive than a precision cathode-ray tube and its associated assembly.

- The image-forming mechanism—the diodes and the fiber-optic light conductors (when used)—is fixed in position and the light emanating from a diode is fixed in intensity. Hence, stabilizing, compen-

sating, high-voltage, deflection, and other circuits are completely eliminated.

Such problems as drift, astigmatism, defocusing, nonlinear effects, raster size variations, and so on no longer exist. The avoidance of these circuits is, of course, another important source of cost reduction. Moreover, in the respect that an excluded circuit cannot fail and therefore needs no service, the reliability of the LED recorder surpasses that of a CRT microfilm.

• The innumerable controls needed for CRT adjustments are simply missing from LED recorders. In particular, the expensive digital-to-analog conversion process of CRT units is bypassed.

To be sure, the photo-optical control of a LED recorder must effect the necessary frame registration or the advantages of the fixed LED array will be lost. Since equivalent control is needed in a CRT recorder, the LED principle is not at a disadvantage in this respect. Indeed, one of the advantages of LED imaging is the concentration of precision control in the photo-optical section instead of in two places.

This is the second in a series of articles on the use of light emitting diodes in the COM industry. Mark Flomenhofs is Associate Editor of Auerbach Graphic Processing Reports.

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Common Carriers Will Still Dominate Modem Markets in 1975: CSI

PALO ALTO, Calif. — Two common carriers will dominate the revenues derived from the sale and lease of modems and multiplexers, but 10 independent manufacturers are expected to reach annual revenues of over \$10 million by 1975, according to Creative Strategies, Inc., here.

The market for modems and multiplexers is estimated to grow from \$70 million in 1970 to \$390 million in 1975, the firm said.

Of the five modem hardware segments—acoustic couplers, low speed (0-300 bit/sec), medium speed Bell compatible, medium speed non-Bell compatible and high speed (9,600 bit/sec and above)—the low speed modems are expected to experience the greatest unit growth, while non-Bell compatible modems (2,400- to 9,600 bit/sec) will have the greatest dollar growth.

Signetics Planning ROM

Simulator With a Memory

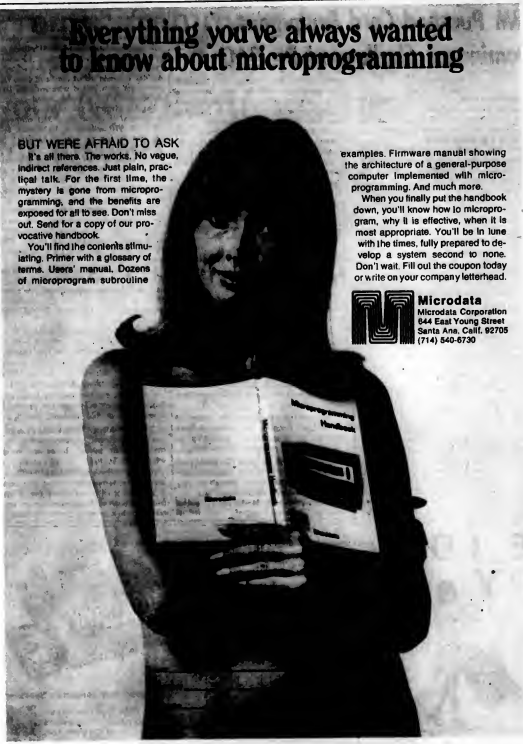
Capacity of Up to 64K Bits

SUNNYVALE, Calif. — Signetics Memory Systems, Inc. is offering the SMS 1000A ROM simulator, a semiconductor storage system operated in a read-only mode to simulate read-only memory storage arrays.

The SMS 1000A can be configured to simulate up to 16, 4K bit ROMs or a total of 64K bits. The simulator interfaces with customer equipment via the 16 or 24 DIP connectors of the buffered simulation cable. Access time at the connector of the 5 ft. long simulation cable is 120 nsec.

The SMS 1000A simulator may be loaded manually or with paper tape. Other features encompassed by the system include manual data editing, verification and protection of the contents of the memory module and self-test capability of the complete system.

The SMS 1000A is available for purchase, lease or rental. The basic mainframe with two, 4K bit simulation modules and cables is priced at \$4,350.



July 28, 1971

Market 'Inscrutable'

Chinese Developing Homegrown Computer Industry

By Bohdan O. Szuprowicz
Special to Computerworld

HONG KONG—If you are planning to move into that vast Red Chinese computer market in the foreseeable future, be prepared to compete with original Chinese computer equipment as well as peripheral devices.

Red China's computer made its debut at the Canton Trade Fair held earlier this year, and will most certainly be exhibited at the forthcoming show in Canton next October, according to Ting Ke Chien, general manager of China Resources. The organization acts as coordinating agency for a variety of Red China foreign trade corporations.

The particular agency concerned with import as well as export of computers is the China National Machinery Import and Export Corp. of Peking, known simply as Machimpex.

No one really knows how many computers there are in Red China today, nor what type of equipment is installed. However some scraps of information collected from several "China watchers" in Asia give some outline of what is going on inside Red China.

Late in 1967 Red China did purchase some computers from ICL in the UK. An ICL 1903 and 1905 were then shipped to China together with a full complement of ICL peripheral equipment.

But no support or programming help was requested and no ICL technicians were allowed to accompany the equipment or help with its installation although Chinese programmers did go to London for training.

Prior to the ICL sale the Chinese were known to use some early first generation Russian computers. They later apparently obtained more advance equipment from Czechoslovakia which manufactured Russian computers under license agreements with the Soviets.

All sales to Red China by ICL were made in London with the agreement of pertinent American authorities because the machines shipped to China contained U.S.-made components.

Contracts

Lockheed Electronics Co., Inc. will supply computing center support services to NASA's Manned Spacecraft Center under a recent \$20 million contract.

Bell Telephone Laboratories has awarded a \$825,000 contract to System Development Corp. to manage a general-purpose computer system at Bell's Medison, N.J., facility for the next 14 months.

Conrac Corp., under a \$150,000 pact, will develop a computerized board board display system for Continental Illinois Bank and Trust Co.

A \$750,000 contract for maintenance support for the Developmental Tactical Operations System has been awarded to Computer Sciences Corp. by the Army Electronics Command.

The Federal Aviation Administration has increased its contract for modems with Data Products Corp. by \$3.9 million, bringing the total contract to around \$4.9 million.

Computer Sciences Corp. will process the data gathered on aftershocks from the earthquake in Los Angeles last February under a contract with the National Oceanic and Atmospheric Administration.

Consolidated Analysis Centers Inc. has landed a contract from the Air Force for the implementation of the Simscript II language compiler on several GE 600 computer systems.

The ICL Hong Kong office is not actively pursuing business in Red China but neither does it sell computers in Taiwan. Some unofficial approaches, however, were made here about possible future computer business by members of several Communist organizations which maintain offices in Hong Kong.

Now that the trade barriers with Red China are being lowered, many businessmen from Western countries and particularly the U.S. are beginning to make approaches to sell their products to the Chinese. But Chien of China Resources believes it is a little too soon to actually discuss business yet.

Produced at 'Light Bulb Factory'

While China has produced a computer, it is not believed to be in commercial quantities or even applicable to use in countries outside China. The Chinese

computer was first produced as recently as February 1970 at the Shanghai Huailai Small Light Bulb Factory which is apparently run by Chinese housewives.

Design work and circuitry was coordinated with other factories, colleges and scientific research departments, one of which almost certainly was the Shanghai Institute of Computer Technology. This is in line with a planned expansion by the Red Chinese of the electronic industry and a rapid build-up of transistor technology of their own.

Best contact point for trade connections and further information about doing business with the Red Chinese is probably the China Resources Agency located in the Communist Bank of China building just across from the Hong Kong Hilton. China Resources is a Communist government agency.

The general consensus in Asia is that

China may well remain a vast market for computers with little to offer anyone in the West. First the Chinese are obviously making an effort to develop their own and while this may not be up to Western standards it will be more than adequate for their own internal use.

In addition, with a population of 800 million plus it is easy to organize people into a "human computer" in the processing of non-scientific or space type activities. Several industry observers in Asia believe that such an approach in a labor rich society is not to be ruled out.

And last but not least, Hong Kong New Territories will automatically revert to Red China when the lease expires in 1989. Communist investment in Hong Kong is considerable, so if in about 20 years the whole area is simply taken over, all existing plants, including the 60 odd machines today will become Chinese.

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Wabash Disk Memory



C-O ROM/RAM Test Unit



Cipher Ecma Transport



Wang OEM Transport

Planned for Wescon

Signetics Expands Bipolar ROM Series

SUNNYVALE, Calif. — Signetics Memory Systems plans to show systems-oriented versions of the "largest available" bipolar ROM at Wescon.

The products are new organizations of the SMS 8228 which was introduced last February. The 8205 4K bit ROM is organized 512 by 8 and the 8204 2K bit ROM is organized 256 by 8. Both devices have 35 nsec typical access times.

Both the 8204 and 8205 are available in a 24-pin package and feature low power dissipation. The 8205 dissipates 165 μ W/bit. Standard code converter patterns are available. The 8205-CB175 is encoded as an Asci-to-Ebodic and Ebodic-to-Asci converter. The 8204-CB504 is encoded for Asci-to-Ebodic and the 8204-CB505 for Ebodic-to-Asci conversion.

In 100 quantities the 8204 sells for \$16.40 and the 8205 for \$29.50. The 8228's reduced price is \$25 in 100 quantities from a prior \$40, 9408.

Wabash Disk Has 10-Mbit Capacity

PHOENIX — A rotating disk with 10-Mbit capa-

city from Wabash Computer Corp. has an average access time of 17 msec, providing 128 tracks for storage and retrieval.

The 1280 is the fifth model offered in the company's Disc Memo Series. Read/write heads and 128 recording tracks are permanently sealed in a dust-free enclosure. Recording surface is nickel cobalt.

The 14-in. diameter disk uses TTL circuits on all input and output lines. The unit is priced from \$9,250, and delivery is quoted at 60 days.

Unit Tests ROMs, RAMs

BROCKTON, Mass. — C-O Manufacturing's Random Access Memory/Read Only Memory Tester automatically or manually exercises the element under test for production and receiving inspection or engineering evaluation.

The tester is specifically designed to logically test static DTL-TTL compatible 256 by 1 bit RAMs and 256 by 4 bit ROMs but as an option can be modified to test up to 4K by 8 bit memories and interface to other logic levels.

ROM/RAM test units are now available from the firm through P.O. Box 125, 02403, for under \$5,000.

Ecma Cassette Transport Bows

SAN DIEGO, Calif. — An OEM version of the Cipher C200 cassette drive from Cipher Data Products employs Philips type cassettes.

New OEM Products

The C-200 transport is designed to conform with the new proposed Lcma/Ansi standards for information interchange including 800 bit/in. phase encoded recording.

The electronics package utilized in the C-200 is available to large OEM users in either schematic or artwork form from Cipher at 7655 Convo Court, 92111.

Wang Mag Tape Unit Debuts

SANTA MONICA, Calif. — Wang Computer Products' read-only magnetic tape transport system is designed for use with offline printers, COM, and other data conversion systems.

The system consists of four basic subassemblies which are the tape transport, transport electronic, data electronics and power supply. The complete system is self contained and is designed for 19 in. rack mounting, according to Wang at 2400 Broadway, 90404.

NAR Offers 5K-Diode, SOS ROM

ANAHEIM, Calif. — North American Rockwell Microelectronics Co.'s 5K-diode ROMs are manufactured with its silicon-on-sapphire (SOS) process. The units can be individually encoded to customer specifications within 24 hours with a specially developed laser micromachine tool, the firm claimed.

Packaged in NAR's standard 42-lead flatpack, the custom encoded SOS ROMs are priced at \$64 in one to 99 quantities, and \$26 in 1,000-plus quantities.

The present circuits have a density of 400,000 diode/in.², which is the practical limit for laser encoding. Mask encoding allows a density of 1 million diode/in.², said the firm at P.O. Box 3660, 3430 Miraloma Ave., 92803.

Computer Interface Tester Decodes

MORTON GROVE, Ill. — A computer interface data tester, developed by Convo Systems, Inc., will monitor one 16-bit word of data from a field source and display it in digital form, and decode the data into a numerical read-out.

The device incorporates solid state circuits for switching and decoding. Hex and BCD to 7 segment decoding is accomplished in a hybrid circuit in the display module. Binary to BCD decoding is accomplished by using binary and BCD up down counters, according to the firm at 6451 Main St., 60053.

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Honeywell Midyear Statement Confirms Mainframe Makers' Profits Declining

MINNEAPOLIS—Honeywell is the latest of the mainframe makers to issue its midyear report, and the trend remains down.

While reporting lower results for the overall company, Honeywell said that revenues from computer operations were "ahead" of last year, in contrast with its major rival for the number two slot in the industry, RCA, which last week reported higher overall revenues but disappointing results in the computer business.

Neither of the rivals for second place in the industry could match the record revenues and earnings registered by the industry leader, IBM, in its midyear report. But IBM's growth was slower in the six-month period than in recent years.

Honeywell's midyear report indicates that the firm had a sharp drop in the second quarter, following a disappointing first quarter.

In the second reporting period earnings dropped around 39% from \$14.9 million (86 cents per share) to \$9.2 million (53 cents per share). Sales of \$461.3 million were off 6% from the \$489.1 million registered in the second quarter a year earlier.

In the first six months the firm's earnings slumped to \$16.1 million (93 cents per share), down 44% from the \$28.7 million (\$1.68 per share) reported at the same point a year ago. Sales were \$890.7 million, down from \$950.4 million last year.

Honeywell said that the computer business "was good world-

wide" but that there was a "relatively low level of computers sold outright rather than leased." Chairman James B. Binger said that the order rate for computer systems was "encouraging."

From the first reports from the mainframe makers, the old adage that says, "when IBM sneezes, the rest of the business catches a cold" seems to be holding up.

Things are not going as fast as usual for IBM, but the rest of the mainframe makers would settle for any growth in computer-related earnings.

Sanders Issues Special Report To Register \$23.6 Million Loss

NASHUA, N.H.—In a special report for the 11-month period ended July 4, Sanders Associates Inc. has reported a loss of \$23.6 million on sales of \$133.7 million.

In the full 12-month fiscal year ended July 31, 1970, the firm earned \$782,000 (17 cents per share) on sales that amounted to \$173.6 million.

At the same time of the 11-month report, however, the firm announced that it had established new banking arrangements that will alleviate its shortage of working capital (CW, June 30).

The loss in the 11-month period reflects an accounting change that accounted for \$14.9 million of the loss. Under the changed procedures, the firm wrote down development costs that had not been written off in the past five years.

Nickels & Dimes

A Washington, D.C., investment broker, Donatelli, Rudolph & Schoen, Inc., says that "a commitment in the common stock of Logic Corp., at this time, will give the investor the best participation in the rapidly expanding key-to-disk" market and "afford the aggressive investor above average price appreciation potential over the short, intermediate and longer term."

SSS
Arcata National Corp. expects to have a modest net loss, before an extraordinary item, for the year ended June 30. Reason for the loss was given as write-off of receivables and inventories. The extraordinary item will be increased by the disposal of small nonprofitable information operations, the firm said.

SSS
Datatab Inc., which had its first loss in 11 years last year, is seeing a turnaround. Chairman Gerald Yes told security analysts that the second quarter earnings for the firm would probably match the 8 cents per share registered in the first quarter. The shakeout in the computer services area last year has given the survivors a larger market to serve, he said.

SSS
Digital Scientific Corp., maker of the Meta 4 computer, has grabbed \$1.7 million in long term private financing and has arranged for the conversion of around \$460,000 of other obli-

gations into long-term notes.

SSS
Advanced Computer Techniques Corp. sustained its first loss in nine years during the year ended March 31, when the loss reached \$282,122 on sales of \$2.7 million, down from revenues of \$3.2 million a year earlier. The firm said that the adverse trend had not completely abated but that there was some indication business conditions were improving.

SSS
Business is apparently good in the mainframe memory replacement market: Computer Investors Group has reported a 40% gain in earnings on an 18% gain in sales for the quarter ended June 30. Income was \$400,970, up from \$285,824 in the same year-ago period. Revenues reached \$2.8 million, up from \$2.4 million.

SSS
American Research and Development Corp. has declared a dividend of 7 cents per share, payable Aug. 31 to holders of record on Aug. 6.

SSS
Digital Computer Controls, Inc.'s sales for the first quarter ended May 31 rose sharply to \$631,799 from \$62,007 the same period a year ago. Earnings totaled \$164,942 (13 cents a share) compared with a loss of \$49,637 in the first quarter last year.

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